

Introduction by Paul Pritchard

It was June 1994. Steve Quinlan and I had just made the first ascent of 'Adrift' on El Capitan, a line originally attempted by Steve and John Middendorf. Now we were on our way to Baffin to climb West Face of Mount Asgard.

We stopped by the A5 factory in Flagstaff to scrounge some crucial gear. This wasn't long after Middendorf, or 'Deucey' to his mates, had made the legendary climb of 'The Grand Voyage' on Great Trango Tower with Xaver Bongard. That really cemented his reputation as the pre-eminent master of 'big-wall'. His A5 brand was quite simply THE only big wall climbing gear to own in the '90s. So much thought and a wealth of experience went into each curve of his hammers, each stitch of his portaledges and haulbags.

Deucey gave us a tour of the factory. Where they were making A5 Birdbeaks (the first production of hooking pitons), I remember the deafening whirr of the grinders and fearful screaming of lathes, the thumping of presses. The torture instruments of a metal workers shop - welders and callipers, snip and punch. Dirty unmarked tins of borax flux and Swarfega on shelves, metal shavings under your feet. All the while the all-pervasive smell engine oil.

I also recall Deucey being very interested in the scarcity and minuteness of the gear that I employed on my Gogarth test pieces. You see, the beaks and skyhooks that John was using on his massive aid climbs, I had coopted for my run-out free climbs.

After his Trango ascent, Deucey's fame spread far and wide. As well as being intensely busy manufacturing all things A5, he was writing articles for Climbing Magazine back then, and he wrote a short "Players" piece about my climbs, about my crossover into big walls in India and Baffin Island and Patagonia.

It took us a couple of years to actually climb together when we made an ascent of The Old Man Of Hoy, and one of those firm climbing friendships came into being. I invited Deucey to write the foreword for Deep Play and 25 years later here I am returning the favour.

John and I once chatted about collaborating on a book about the technical innovations that always precede a leap forward in standards. An example in climbing terms might be the front point resulting in the first ascent of the North Wall of The Eiger, or the hardening of steel at the turn of the 20th Century, causing the great leap forward in big wall difficulty. And, of course, big Himalayan alpine style walls would have been impossible without Deucey's lightweight portaledge design.

Deucey's brain went into overdrive, expanding on a piece he had once written for Ascent called "The Mechanical Advantage." He began researching the most obscure climbing equipment inventors from the past. Through his reassessment of the history of the tools of the climbing trade he uncovers some really surprising truths - unknown or forgotten ones in the history of the evolution of alpinism. As well as posing challenges to orthodox climbing histories, Deucey also reassesses such legends as Konrad Kain, Miriam O'Brien, Max Strumia and Richard Leonard.

His backyard shop in Tasmania, as Deucey calls the nerve centre of the D4 open-source design, is exquisite chaos. If you happen to venture there you will see manikins loaded down with big wall racks, posters and topos of his beloved El Cap (with hand drawn variations to the mapped-out climbs), strange tools all arranged perfectly smallest to largest, 3D printers and an aid climbing Barbie doll. Plus, of course, prototype portaledges, ranging from tiny models to full size, hanging all over the place.

When I finally climbed my nemesis, The Totem Pole in 2016 (after nearly being killed on it 18 years before), we had long debates, sometimes heated, about the best rope ascending rig. We rigged something up one day on the trapeze at the shop, but somehow it got changed to what Deucey says was a crap system (I could go up on my own, but not down), and I have more than an inkling that he was correct. My shoulder hurt for 2 years afterwards!

Deucey has done much for the small number of elite big-wall climbers who need the lightest, most compact gear and who are going up on the wildest big rock walls in the world. Yet, he understands the trade-off between the size and weight of the kit and the danger the climber is willing to accept.

And that, in essence is what his recent research and these volumes are about - technology versus risk. Paul Pritchard
Taroona March 21, 2023

Tools for the Wild Vertical

The Mechanical Advantage

Volume 2: North American Tools and Techniques to the 1930s.

By John Middendorf

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This PDF has been compiled from online research articles originally posted on bigwallgear.com. The original posts are searchable here: http://bigwalls.net/search.html

This digital PDF should be easily searchable for keywords. I call this kind of research "breadcrumb research", providing direction to original sources, and hence digital links are often included. Original digital scans and library resources are noted, and a future project will be to index the work and fully reference with bibliography.

There is a huge list of people who have helped me with this research, and I plan to compile the list of helpful folks as I continue with this series. In the meantime, thank you the many who have contributed to this work.

This work will be accessible on bigwall.net, so if you want to reference it, the way I have seen my other work referenced in academic papers:

J. Middendorf, "Mechanical Advantage: Tools for the Wild Vertical, Volume 2," 2023 [Online]. Available: http://bigwalls.net/search.html [Assessed (current date)].

Foreword, Volume 2--Mechanical Advantages in Rock Climbing

When people think "Mechanical", what often comes to mind first is machined metal, gears and hammers, grinding and pounding to achieve an objective. But soft, tensile-only components are also mechanical parts of rope and anchor systems, as any engineer doing the calculations recognises. The improvements of rope-piton-link systems in the mid-20th century cannot be underestimated in what new risks climbers were willing to take on the vertical.

In the first half of the 20th century, knowledge of new European climbing techniques spread around the world, filtering into the North American big wall landscapes—the Bugaboos, Rockies, Tetons, Wind Rivers, Adirondacks, and the Sierras. Pure aid techniques, pioneered in the Dolomites, were ever-refined, and bold free climbing reached new levels. Climbers were also systematically testing the limits of falling with piton and rope protection systems. This Is the story from the mechanical advantage perspective.

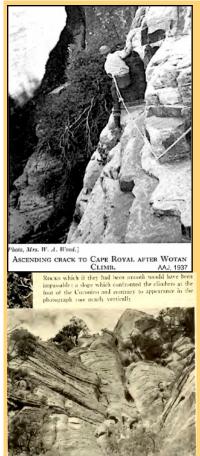
Note: This book is a compilation on my bigwallgear.com online articles and has been a journey of learning more about things often wondered about as I lived the life of a rock climber many years ago-I grew up reading Chris Jones (Climbing in North America), Steve Roper (Yosemite history), Doug Scott (Big Wall Climbing), Walter Bonatti, Gaston Rébuffat, and other epic literature, and it has been fascinating to delve into ancient books easily found on online booksellers, and the many international primary journals now online, to delve a little deeper--and to be able to share instantly and to collaborate with so many sources and friends. Cheers from Tasmania!

PART 1-CLIMBING TOOLS AND TECHNIQUES EARLY NORTH AMERICAN DEVELOPMENTS

Background

Prior to European incursions, Indigenous mountain climbers had summited many of the prominent peaks in the mountains of North and South America, traversed trade routes of notable vertical difficulty through the Grand Canyon, and perched safe homes on precarious cliffs, accessible only via exposed rock climbing. Many of the highest summits in the 'Rocky Mountains', first named in Morse's *American Geography* (1794), had been climbed prior to white settlement (Bueler, 2000).

In the American Southwest, bold technical climbs¹—both free and aid—had been done by the Hisatsinom, Freemont, Mogollon, Hohokam, Acoma, and many other peoples for over a thousand years. On the steep sandstone tower and cliffs, the ancient's level of difficulty was on par with rock climbing standards up to the advent of modern mechanical tools, as many explorers have discovered and documented, after following unmarked paths then surprised and amazed by the signs of occupation and visitation of a prior epoch.



In 'The Facts about Shiva--the real story of one of the most popular scientific adventures in recent years', Harold Anthony clarifies in the American Museum journal, in response to the fanfare regarding their noted and technically difficult 'first ascents' of Shiva Temple and Wotan's Throne (AAJ 1937), "Many flint nodules occur in the limestone that caps Shiva, and this locality was apparently a favorite source of supply. Pueblo Indians, not much later than about 1000 A.D. climbed Shiva Temple to collect flint and to harvest mescal. We found an abundance of flint chips and a few definitely shaped artefacts such as spear points, scrapers, perforators, etcetera."





Katzimo butte (130m vertical) in modern New Mexico, known to early Spanish invaders as "Enchanted Mesa", <u>first climbed</u> with wooden "bolts" in holes carved by stone tools.

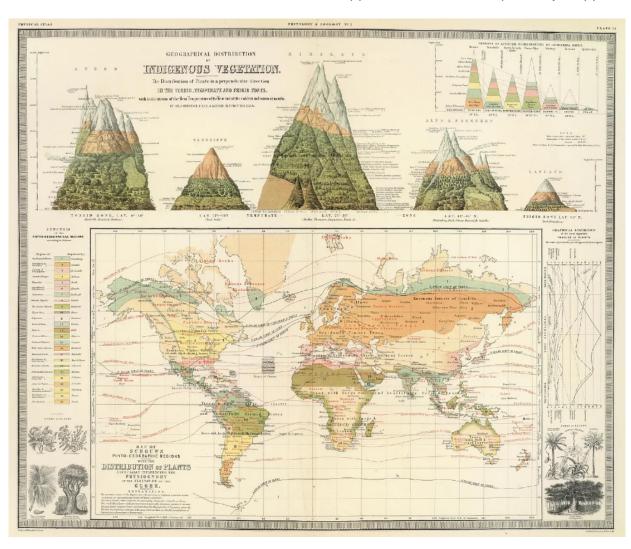
Right: pottery, carved obsidian, beads found on the summit.

¹Footnote: I have spent many years wandering around the American Southwest from 1986-2008, often solo, in search of the 'unknown'. The boldness of Indigenous climbers is stunning, even as a 5.11+ climber and B1+ high boulderer, I was often amazed by the wild established routes, especially through the Grand Canyon (some 5.10xx).

Science and Mapping Surveys of the West

With most of the oceans mapped by the late 1700s by the Europeans, scientists began to explore inland for new data, often to the loftiest summits, in search for global patterns of Earth's systems; in the "new lands" recently discovered by Europeans, early mountain climbing pursuits in the Americas, as on the other continents, were often scientific expeditions.

As immigrants tenanted the American west, the need to map and partition land prompted early government or commercially sponsored inland survey expeditions, such as the ones led by Alexander Mackenzie (1792), Simon Fraser (1805), and David Thompson (1807) in Canada, and further south by Clarence King, Ferdinand Hayden, John Wesley Powell, and George Wheeler in the mid-1800s. These surveys generally followed the paths of the Native Americans, which had also been known to early trappers and miners, and precisely mapped



Early mountaineering activity was driven more by scientists, whose primary aim was to provide further evidence of a global "Unity of Nature" (i.e. <u>Humboldt 1827</u>). <u>David Rumsey collection.</u>

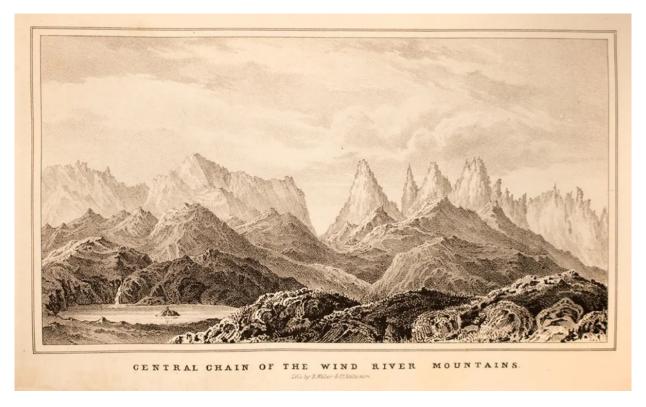


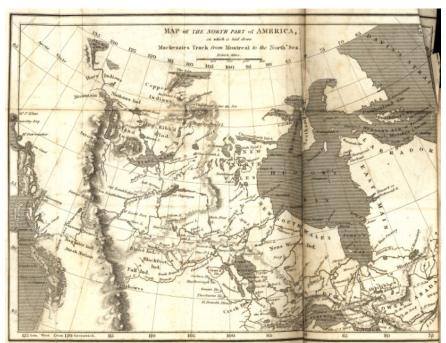
Illustration from the "Report of the Exploring Expedition to the Rocky Mountains, John C. Frémont". In 1842, Frémont and five companions climbed Gannett Peak, the highest peak in the Wind River range. Brigham Young later used Fremont's maps to migrate the Mormon people to the Salt Lake region of the Great Basin. (Image: Western Libraries Heritage Resources).

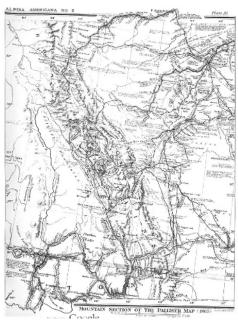
the terrain in respect to the Greenwich meridian, which became the basis for international and national treaties. Many of these expeditions had an adventurous spirit beyond the requirements of their missions and made technical ascents of summits with rudimentary rope safety systems and occasional spikes hammered into the rock.

In the period oft coined as the "modern era of mountaineering," when climbing for sport and the pursuit of mountain "conquests" became popular, recent arrivals to North America were also game to join the fun on

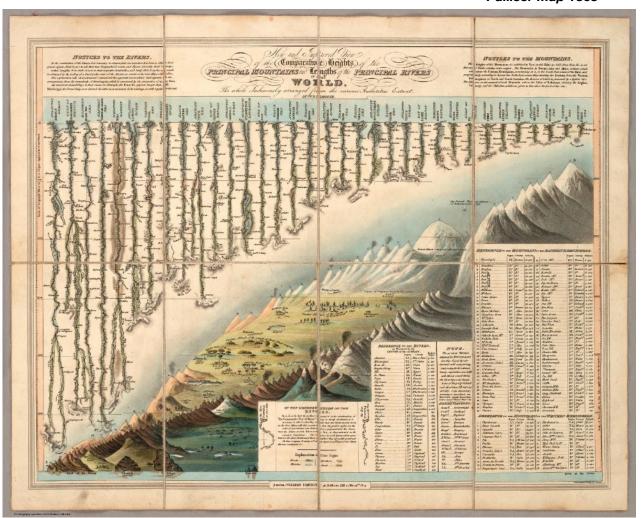
the new terrain². Epic tales and maps of explorations around the globe and to the poles were widely read in newspapers and journals, and so it was with the first ascents of the highest mountains, which were then often (re)named, reported and celebrated worldwide. By the late 1800s, the legend of Whymper's ascent of the Matterhorn with ice axes and (broken) ropes was common lore, though little was known of the more systematic lightweight approaches developing in the Eastern Alps for steep rock.

² Footnote: With climbing's chance for local and international renown, along with this era came the controversies and arguments as to the "first ascent", cumulating in later debates such as the first ascents of the Grand Teton and Denali, though others gave credit where credit was due: "Above us but thirty feet rose a crest, beyond which we saw nothing. I dared not think it the summit till we stood there and Mount Whitney was under our feet. Close beside us a small mound of rock was piled upon the peak, and solidly built into it an Indian arrow-shaft, pointing due west. I hung my barometer from the mound of our Indian predecessor, nor did I grudge his hunter pride the honor of first finding that one pathway to the summit of the United States, fifteen thousand feet above two oceans." (Mountaineering in the Sierra Nevada, Clarence King, 1871 on the "false" Mt. Whitney).





Palliser Map 1865



The early days of rock climbing in North America

The routes to the technical summits of <u>Tu-Tok-A-Nu-La/Half Dome</u> in Yosemite (1875) and <u>Bear Lodge/Devils Tower</u> (1893), covered previously, were engineered by the first summiteers, and involved construction tools and materials to create an established path with ladders and fixed ropes that could be followed by others. But as climbers eyed the rocky peaks from the Appalachia to the Sierra, lightweight rope and anchor systems were gradually evolved for the vertical challenges.

One of the first rock climbing epicenters in North America was the Adirondacks in the eastern USA, with rock climbs dating back to the mid-1800s by those pursuing "spiritual uplift" in the mountains for sport (Fay, 1910), often prompted by the naturalist writings of Ralph Waldo Emerson and Henry David Thoreau. The Appalachian Mountain Club³, one of the earliest North American clubs, modeled itself after the mountain associations in Europe to provide access and huts in remote mountainous regions. Its magazine Appalachia was the only mountaineering journal in America from 1876-1893. As the sport blossomed in the late 1800s, Appalachia was followed by the Sierra Club Bulletin (San Francisco) in 1893, the Mazama (Portland) in 1896, and later by The Mountaineer (Seattle) and the Canadian Alpine Club Journal in 1907. The American Alpine Club was founded in 1902, and in 1907 published its first Alpina Americana on the High Sierra (by Joseph N. LeConte,





Left: map of the "wilderness" and right: Chapel Pond in the Adirondacks. John Case, an early president of the Appalachian Mountain Club, had spent years in Europe and had climbed the east face of Monte Rosa in 1911 with George Finch (of Everest fame). Case employed roped belay techniques at the Chapel Pond Slab and other areas in the Adirondacks.

³ Charles E. Fay, professor of Modern Languages at Tufts College in Massachusetts, <u>describes the founding of the Appalachian Mountain Club</u>, noting that several clubs, including the "little Alpine Club" preceded it, but were "fated to a brief existence and passed with dissociation of the groups creating them". Fay presided over meetings of the Appalachian Mountain Club for over 25 years, before becoming elected as the first president of the American Alpine Club in 1902 (Source: Appalachia, vol 14, 1916-1919).



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C. E. Fay. Ascent of Mount Temple by a new route . . .

Left: Map of the southern Appalachian Mountains, Eastern USA. Note that the Adirondacks is technically a separate range, but often included in reference to the "Appalachia". Right:1905 Appalachia articles. The AMC's main focus was on the international developments of mountain climbing, members of the club developed techniques in the Adirondacks and other steep rocky mountains of the Eastern USA, though these rock climbs (or the techniques used) were rarely reported. This was a time when it was easier for East Coast Americans to travel to the mountains of Europe than to the western North American ranges, and many of them returned with European climbing tools and techniques.

AMERICAN MOUNTAINEERING JOURNALS

APPALACHIA. Appalachian Mountain Club, Boston, since 1876.
SIERRA CLUB JOURNAL. Sierra Club, San Francisco, since 1893.
MAZAMA. The Mazamas, Portland, Oregon, irregularly 1896 to 1907, annually since 1912.

Mt. Whitney Club Journal. Visalia, California, three numbers, 1902, 1903, 1904.

ALPINA AMERICANA. American Alpine Club, 1907, 1911, 1914.
CANADIAN ALPINE JOURNAL. Alpine Club of Canada, Banff, Alberta, since 1907 (except 1914).

The Mountaineers, Seattle, Washington, since 1907.

The Northern Cordilleran. British Columbia Mountaineering Club, Vancouver, B. C., one number, 1913.

Trail and Timberline. Colorado Mountain Club, Denver, Colorado, 1915 and 1916.

American Mountaineering Journals 1916



Thomas Moran, The Three Tetons, 1895, White House art collection. The Trois Tetons ("three breasts"), named by French explorers in the early 1800s, was a major landmark in the American West for travelers in the 19th century. followed by Charles E. Fay on the Canadian Rocky Mountains in 1911 and Alfred H. Brooks on Alaska in 1914). In addition to these organizations, there were dozens more smaller clubs that gathered throughout North America to discuss and plan climbing trips. Though membership was generally local, many club periodicals covered global developments, and along with invitations shared among clubs to join each other's "excursions", rivalries also soon began for recognized "unclimbed testpieces".

SUGAR LOAF, 1889

Despite the fact that there was an easy way to the summit, an unknown yet intrepid climber drilled safety anchors for a scenic climb up the west wall of Sugar Loaf in the Adirondacks, a climb reported in 1889 as an airy traverse along a cliff "furnished with iron pins sunk in the rock at the most difficult points. A single false step on this path would hurl the incautious climber to instant destruction." Ropes were recommended. The original description reads, "On the west there are dangerous precipices, and it is on

this side that the guide-book describes the ascent. The route via the "iron pins sunk in the rock" is one made some years ago by an adventurous climber of the neighborhood who wished to ascend Sugar Loaf on its only dangerous side, and adopted this expedient to accomplish his purpose." (Appalachia Vol 5, and A Guide to the White Mountains, Sweetser, 1891).

MT. KING, 1896

In 1896, on a solo ascent of the striking Mt. King (now Mount Clarence King in Kings Canyon National Park), Bolton Coit Brown, a well known New York painter and printmaker (and later director of Stanford's <u>art school</u>), reports jamming a thrown knot in a crack to overcome "a smooth-faced precipice," not possible to climb "unaided". He used this technique repeatedly, as well as stepping through a makeshift rope aider to overcome a final steep section of one of Sierra's first documented crack climbs (Sierra Club Bulletin, *Wanderings in the High Sierra*, 1897/99).





Left: Clarence King, 1870s. Right: Mt. Clarence King named after King in the upper left (USGS photo, 1904). Clarence King climbed many technical peaks in the American West. Read King's journal <a href="https://example.com/here/beachtosale-read-time-read-ti

GRAND TETON 1898

In contrast to Half Dome and Devils Tower ascents (see Volume 1), the highest summit of the Three Tetons in Wyoming involved a more alpine approach. On the first documented ascent of the Grand Teton, rudimentary rope safety techniques were employed, with one person leading, while the rest of the team stood fast, paying out the rope. This technique was already being refined to an art on steep rock in Britain. using natural anchors at places where it was possible to tie the rope into a horn of rock often called "belay pins" - and sometimes two-person belays were recommended, with one person mid-pitch, perhaps in a more precarious position to assist the leader. while the main belayer had a firm position.

On the Grand Teton, the highest summit of the Teewinots (the Shoshone term for the range), Indigenous people had previously climbed to a small perch on an airy saddle, only a few rope lengths (600') of steep rock from the summit, and had built a structure known as the "Enclosure." On August 11, 1898, after eleven hours of climbing, a team under the auspices of the Rocky Mountain Club, led by the experienced mountaineer Franklin Spalding, and organized by William Owen (who had made three prior attempts), made it to the Enclosure from their camp several miles away. Then, with sturdy rock and ice climbing ability, careful route-finding involving an exposed "squirm" along a narrow ledge, and the use of the rope lassoed over a horn to pull themselves up, the team discovered a climbable route up the final steep cliffs to the summit.



The Grand Teton from the top of Table Mountain on the Idaho side, by Hayden Expedition photographer William H. Jackson, August 1872 (Getty Museum).

Spalding writes: "Our outfit consisted of 450 ft. of rope. two ice axes, two iron-pointed prods, a half dozen steel drills and twenty iron pegs. We made the top, however. without having to use the drills or pegs.4. The ropes were used for safety and "roping down" in four places; two days later, the team returned for a quicker second ascent to establish "a monument on the summit that

should be visible to settlers in Jackson's Hole, and thereby verify our ascent" (William Owen, The Alpine Journal, 1899). Despite the preparation and inclusion of rudimentary pitons in their kit for the climb, it was several decades before mechanical tools were next employed for the challenges of the Tetons.



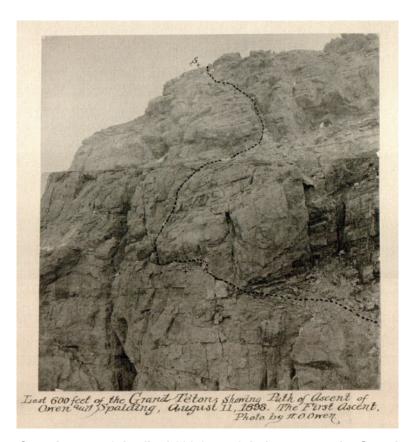
The "Enclosure," a Teton enlama. Was it man-made?

⁴ Footnote: Spalding quote from Denver Evening Post, August 17, 1898 as reported in AAJ, 1939. Renny Jackson writes, "Owen was prepared to drill his way up and fortunately they didn't have to. They did drill one hole at their campsite in a large boulder and pounded one of those heavy eyebolt pitons in it and it is there to this day. Twenty other pins were found by Ortenburger in the seventies beneath this same boulder." The same kind of bolt was placed high up on the mountain in Stettner's Couloir, perhaps placed on a previous attempt by Owen. (See also Grand Ascent, Peter Boutin, 2021, and thanks to Christian Beckwith, Allen Sanderson, and Renny Jackson for additional info).





Shive, Spalding, and Peterson on top of the Grand Teton. Photo by Owen.



Owen's topo of the final 600 feet of their route on the Grand Teton, from the Enclosure. The improbable "squirm" marked with a + is a very exposed climbing crawl but leads to a climbable weakness.



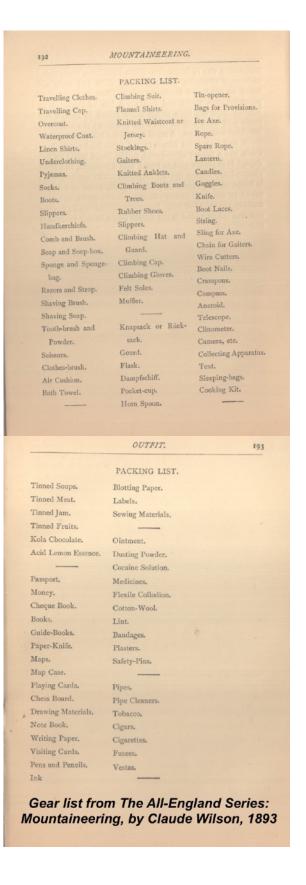
Round spikes from the Owen's party during the first ascent of the Grand Teton. A hole was drilled with a steel drill and one was placed in a large boulder at their campsite.

For nearly seventeen years APPALACHIA was the only mountaineering journal in America. The Sierra Club Bulletin made its first appearance in 1893, Mazama in 1896, The Mountaineer in 1907, and the Canadian Alpine Club Journal in 1907. Fifty-one numbers of APPALACHIA, including a double number at the time of the twenty-fifth anniversary, have been issued, making in all thirteen volumes of about 400 pages each. In addition to reports and proceedings of the club, book reviews and alpine notes, there have appeared 369 articles, divided as follows: White Mountains 132, other parts of New England 38, the mountains of New York 9, Southern Appalachians 7, Cascade Range 4, California 10, the Desert Mountains 5, Rocky Mountains in United States 16, Canadian Rockies and Selkirks 50, Alaska 5, Mexico 4, West Indies 3, South America 3, Europe 20, Asia 14, Miscellaneous 50.

Club journals in North America prior to WWI (Appalachia v.14). Appalachia was the first American mountaineering journal, followed by the Sierra Club Journal in 1893, then the Mazama in 1896, The Mountaineer and the Canadian Alpine Journal in 1907.



Alpina Americana first published in 1907 by the American Alpine Club, then in 1911 and 1914, each a monograph on a particular mountaineering area.



Tools and Technique

In the hearty tradition of American ingenuity, most climbing equipment -ropes, spikes, and other tools to create dugways and blast wagon tracks—was improvised, often cleverly, from other industries. Technical summits like the Grand Teton (now graded 5.4) were an anomaly at the time, as the much greater focus in this period was on climbing safely on the bigger mountains which primarily required snow and ice skills. In 1905, in one of the earliest articles on technique in the Mazama, John Cameron asks, "Shall American climbers adopt European methods?" The article recommends that Americans, "who are mostly right" and are "nothing if not original", to adopt the European style of climbing with experienced guides, one in front and one in back, and no more than six climbers roped together, at least ten feet apart, and with each individual "provided with an ice axe." He laments a recent accident on Mount Ranier and that the "regular Swiss mountain axe" is not readily available from American firms⁵. Indeed, better equipment and more detailed sharing of knowledge of climbing safely with rope and anchor systems took another decade to filter into North America.



59 EDOUARD FEUZ AND CHRISTIAN HÄSLER.

⁵: In response to Cameron's hint towards a regulated climbing as was current at the time in Switzerland, involving peak fees and the requirement of climbing with guides, the Mazama president, C.H. Sholes responds, "The great charm of mountain-climbing in America ... is the fact that the mountains are free to those who seek to derive from them the joy of unaided conquest. Many of them are so free from danger that a person of slight experience in mountaineering can scale them to their utmost summits. Personally, I should regret to see that time come when there shall be guides on our mountains, under State regulation, with the right to prohibit persons from attempting the ascent of any mountain without the service of a guide. If the present interest in mountain-climbing continues (and there is no reason why it should not increase rather than diminish), there will soon be throughout the Pacific Coast region a large number of skilled mountaineers, capable of acting as guides to any mountain in these ranges." Prophetic words, indeed.

MOUNTAINEERING IN NORTH AMERICA

DEEDS AND OPPORTUNITIES ON THE WORLD'S BEST CONTINENT FOR CLIMBING

BY ROBERT DUNN

TABLE OF NORTH AMERICAN MOUNTAINS

Note—In comparing mountains, actual relief ought to be considered secondary to effective height. But to distinguish thus would bewilder in a list using figures. It cannot be done in detail. However, as far as possible, the following is arranged as much in order of difficulty as in order of height. This holds in Group I, generally, except in the case of the Mexican summits. For instance, Mts. Fairweather and Sanford, although much lower, are extremely difficult; Orizaba and Popocatapetl, rather easy. Dickerman, Washington, is easier to ascend than any Canadian peak named—all of which are harder than the far higher summits mentioned in Group III.

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Effective relief gives prominence to peaks in Montana, Oregon, and Washington, in Group IV, over summits of more than 14,000 feet in California and Colorado. But in a list at this stage, isolation and fame must also play a part; so Shasta, Whitney, and even Pike's Peak, precede the harder northern summits. Many Appalachian summits are harder to win than some peaks in Colorado of more than 14,000 feet. But here actual height is great enough to destroy any proportion which attempts to give difficulty in climbing a precedence.

In the state groupings, isolated, especially interesting, or well-known peaks; are singled out—often excluding near-by summits of slightly greater altitude.

Peaks about which some doubt as to height

Peaks about which some doubt as to height exists—Orizaba, by example, in comparison with St. Elias—are denied its benefit. The tendency is always to overestimate mountain heights.

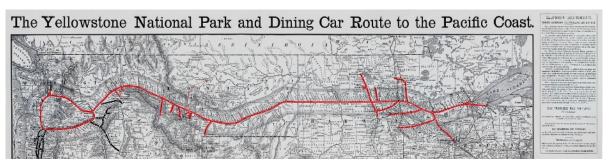
Summits known to be virgin are starred (*).

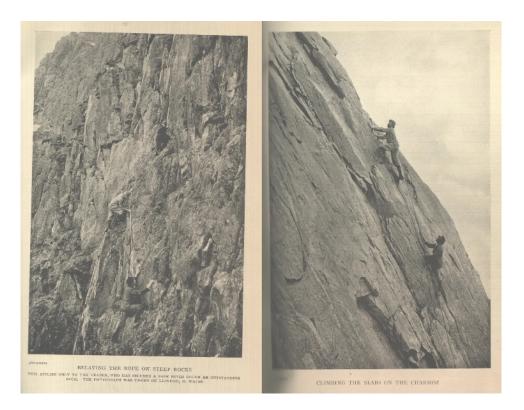
Group 1. Mountains more than 15,000 feet.
Fourteen in number. Ten in Alaska.

I outteen in main	ten in massa.
	Feet.
McKinley Alaska	20.464
*Logan, Alaska	
St. EliasAlaska	18,024
Orizaba Mexico	17.879 (10 18.280)
Popocatapetl Mexico	
*Foraker Alaska	
*SanfordAlaska	
*BlackburaAlaska	16.140
Ixtaccihuatl, Mexico	16,000 (10 17,000)
*CrillonAlaska	15,900
Dickerman, Washir	gton15.766
*VancouverAlaska	
*Fairweather Alaska	15.500
*HunterAlaska	
† Data n	nost unreliable.

(Pully a dozen Alaskan	peaks of more than 12,000	C. IDAHO.	
feet omitted, some still n	ameless, are as battling as	Post Past	
mountains of 8,000 feet almost all those mentions	ameless, are as baffling as p II. Countless Alaskan and over are harder than of in the remaining groups.)	Hyndman Peak	
Group II. Principal Car one of 11,000 feet:	nadian summits. Twenty- and over.	D. COLORADO.	
A. ROCK	Y MOUNTAINS.	Pent Pent	
Robson 13,500 ()† Columbia 12,500 Forbes 12,100	Peet, Diadem Peak 11,500 Victoria 11,400 Humaalee 11,305 Murchison 11,400	Massive 14.424 Princeton 14.19 Elbert 14.421 Yale 14.18 Harvard 14.375 Gray's Peak 14.341	
Lyell. 11,950 Athabasea. 11,900 Athabasea. 11,900 Bryce. 11,800 Goodsir. 11,071 Alexandra. 11,650 The Dome. 11,650 Temple. 11,637	Murchison. 11,000 Lefroy 11,000 Hortor. 11,005 Consolation Peak 11,000 Victoria 11,000 Wilson 11,000 Freshfield. 11,000	(Colorado has thirty-three mountains more than 14,000 feet; one humberd and thirty-nine exceeding 13,000 feet; two humbred and thirty-three exceeding 12,000 feet; three humbred and interly-three exceeding 11,000 feet, and four hundred and seven exceeding 10,000 feet.) 8. UTAH.	
(More than a score o	f others exceeding 10,000.	Feet Fee	
	f others exceeding 10,000. han 9,000 feet.)	Emmons Peak. 13.624 Tockewanna Peak. 13.45 Gilbert Peak. 13.687 Wilson Peak. 13.46 Hodges. 13.500 Peak. 13.66	
Feet.	Feet.	(And eighteen mountains exceeding 12,000 feet.)	
Wheeler	Sir Donald 10.800 Mitre 10.700		
Dawson. 10.962	Mitre. 10,700 Pox 10,500 Purity. 10,500	F. NEVADA.	
And more than a dozer feet,	1 between 9,000 and 10,000	(And thirty-two exceeding 10,000 feet.)	
States.	summits in the United	G. NEW MEXICO	
Whitney Cal	fornia14.502	Fee	
Shasta Cai Raimer Wa Hoad, Ore Baker Wa	14.80 format 14.80 format 14.80 format 12.25 formation 10.52 formation 10.00 oracio 14.108 oracio 13.071	Truchas Peak 1.2.2 Las Trucas 1.2.2 Tuos Peak (And thirty-one exceeding 10,000 feet.)	
Group IV. Northern	Rockies, Olympics, and	San Prancisco.	
		(And seven exceeding 10,000 feet.)	
Cleveland Mo James Mo	ntana 12,500 ntana 10,550 ntana 10,55 ntana 10,023 ntana 10,004 ntana 9,500	I. APPALACHIAN SYSTEM.	
Jackson Mo Sigeh Mo	ntana	For	
And a half dozen off country 9,000 feet and th	ters in the St. Mary River percalmants.	Mitchell North Carolina 673 Roan N. C. and Tenn 633 Washington New Hampohire 623 Warcy New York C.G.	
Olympus	shington 8,150 mpics from 7,000 to more	Lafayette. New Hampstare 5.26 Kthadin. Maine. 5.26	
Pitt	rect,	J. MEXICO, Feet, Foot	
And a half dozen more	than 8,500 feet.		
Group V. Remaining States, by States.	mountains in the United	Tolore College College and	
	LIFORNIA.	Vielo 14,120 Zapotlan 12,743 Cerro de Turana	
Humphreys 14.000	Pinchot	Matlabuevil. 1,034 (2)† Cultura Xe vielo. 14,120 Turana. 1,000 Cerro del Mer- cado. 11,400 (2)†	
		K. GUATEMALA.	
	peaks more than (4,000 feet, peaks exceeding (4,000 feet; 4,000 feet; fifty-five exceed-	Feet	
H. W	YOMING. Feet.	fram a saven brake more than 100 m (ec.)	
Fremont Peak		L. COSTA RICA.	
Chauvenet	11.140	Turrialba	
Case Sixter Pactering	† Data mos	Irazu	

"Deeds and Opportunities". Outing Magazine, 1907, listing many mountaineering challenges (and incorrect elevations).





Photos in The Complete Mountaineer, George Abraham, 1908, a globally distributed textbook on climbing tools and techniques of the era.

Information Sharing

At the time, shared knowledge of climbing tools and techniques filtered slowly from Europe, and English language books such as Clinton Dent's Mountaineering (Badminton Library, 1892), Claude Wilson's Mountaineering (1893, price two shillings), and George Abraham's The Complete Mountaineer (1908) were light on "artificial" techniques such as safety anchors. Even well into the 1920s, the only pitons depicted in English language literature were the very heavy eye-bolt round spikes similar to those used for trail building, and impractical for lightweight mountaineering. That would change dramatically in the early 1930s in the United States and Canada, but in the meantime, the improvisation continued.

Although there are occasional references to pitons as iron pins, spikes, stanchions, or eyebolts in climbing contexts (or, for example, as a way to lower wagons down cliffs as the Mormons had done to get to Bluff on the Hole-in-the-rock expedition in 1879), as it was in England, Canada, and New Zealand at the time, if pitons were used in the late 19th/early 20th century for early rock climbing, few were reporting or admitting it. Rock climbing had been advancing steadily, but climbing vertical rock was an adjunct distinct from mountaineering, as most mountains had alternate paths to the summit that did not require gymnastic steep climbing skills. In the tradition of urban building climbing, by 1900, British climbers were solo free climbing at a high onsight standard, both on buildings and also on the varied rock of the British Isles.6

⁶ In terms of bold gymnastic ability on rock, the standard of free climbing with carefully thought out mechanical protection, the level of technical rock climbing in the Elbsandsteingebirge was beyond anything done in the major ranges for many decades, often incorporating complex acro-yoga type teamwork maneuvers. The history of the region pre-dates any other competitive sports arena in climbing, with pioneer Oscar Schuster's adventures documented in his diaries (Tagebüchern).

"Swiss Guides" come to North America.

Interest in ascending steep rock walls with improved rock anchoring technology developed slowly in the Americas. The major clubs were largely focused on the biggest peaks, and technical rock climbs were still only considered an exercise. Indeed, some of the best overall guides to North American climbing in this era were published in the German-Austrian Alpine Journals by travelers and mountaineers who were more familiar with the limits of the possible on steep rock. DuÖAV articles in 1900 by Jean Habel ("In the North American Alps"), and a 1910 article by Robert Liefmann ("In the Mountains of the United States of America") provided fine fodder for German language speakers, including details on transportation and lodging around the country. Liefmann spent eight months on a "study-tour" comprehensively describing the United States and Canadian climbing developments, noting which major peaks had been climbed, and those still unclimbed. And indeed, many of the first technical climbers to come to North America were German-language immigrants from Switzerland, Austria, Italy, and Germany, sometimes escaping war, rising fascism, and economic depression. And, as in the case of the Canadian Pacific Railway promoting alpine resorts along the railroad, firms hired European guides as early as 1897 to offer guiding services in the North American mountains (as well as invited guest speakers such as Whymper). The guides were often known locally as "Swiss Guides", even though they were not always from Switzerland. It was primarily those who had climbed technical routes in the Eastern Alps who brought new techniques to America, in the period starting in 1916 and into the 1930s, many of the next steps in technical rock climbs in North America were evolved by native German readers (as most of the literature on the new tools and techniques was either in German or Italian), including

Conrad Kain, Joe and Paul Stettner, Fritz Wiessner among others. But this is not to say there were no intrepid Americans and Canadians who also traveled to Europe, learned of the new tools and techniques, established new standards on the North American rock, and eventually pushed the sport even further than what had been achieved in Europe; their stories will be covered next.

--END EARLY USA/CANADA (TO 1910) — This article covered the background and context of a boom of big wall climbing that would take place in the 1930s in North

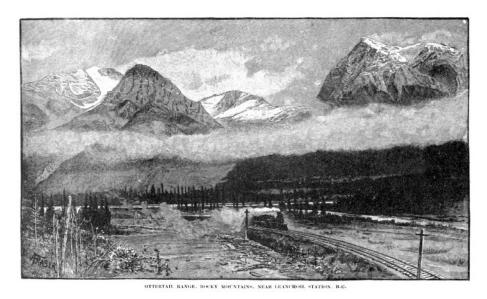
would take place in the 1930s in North
America, and the next chapter will cover
what followed once the new technology was
embraced, and leading up to global big wall
breakthroughs and innovations in the 1930s.

Conrad Kain (brief)

In 1916 Conrad Kain, the renown Austrian guide working in Canada and New Zealand climbed the most technical routes of the day in the Purcell range, including Bugaboo Spire (5.6), which he considered harder than his difficult alpine route on Mt Robson, which today is considered a much more serious proposition due to the length and objective hazards.



Trains and Kain Part 1



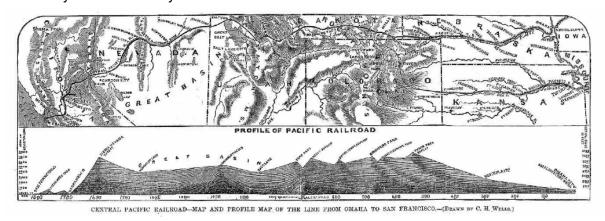
Trains provided new access to the mountains of North America.

Trains

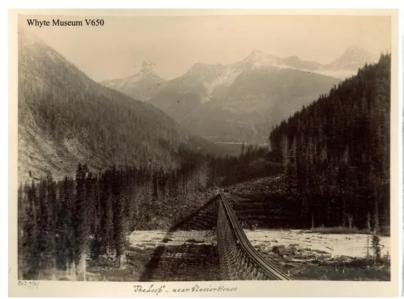
The rising 'Age of Steel' in the 1800s spawned so many new innovations in sport, transport, manufacturing, and war. Emerging triumphant from the Iron Age with new steel mass-production methods by the late 1800s, the Steel Age was initially driven by the railroads, which in turn led to greater access to the mountains. And of course, as is clear by this series, more metals eventually found their way into the North

American mountains as tools for climbing, leading to celebrated accomplishments.

The Pacific Railroad in 1869 spanned North America and was a monumental effort by the train industry, spurring American steel manufacturing to new levels. In November, 1885, the Canadians completed another transcontinental railway, the Canadian Pacific Railway (CPR), and soon began promoting leisure train journeys.



From Omaha, Nebraska to Sacramento, California, 1800 miles of new track through two major mountain ranges—the Rocky Mountains and the Sierra Nevada—was built between 1863 and 1869. The Pacific Railroad act required that all rails were American made, even though the English-made rails were initially of higher quality steel. Ninety-thousand tons of steel rail was rolled in America in 1872 but by 1882, production expanded to 1.5 million tons and by 1900 America became the world's leading producer of Bessemer and Siemens steel.





The train line over Rogers Pass, conceived and mapped by Major A.B. Rogers, involved feats of structural engineering including an elevated double-S-turn "loop" of trestled track and high bridges weaving through cliffs and valleys to maintain a constant slope for the locomotives of the day to pass. A two-mile section required six miles of mostly elevated track looping back on itself for a 600-foot elevation difference. The structures were originally timber involving vast tonnages of wood, and the CPR was granted the right to fell timber along the right of way and built four sawmills to produce trestle beams. The bridges were mostly replaced by steel and stone structures by the early 1900s. Photos courtesy Whyte Museum, Society of Alberta.

Rogers Pass

The concentrated human effort to create the first transcontinental railways, completed by tens of thousands of workers from start to finish in a few years, is difficult to imagine today. One of the most problematic passages in establishing the transcontinental Canadian Pacific Railway was the route through the Selkirk range. The line over Rogers Pass, just west of the Continental Divide in British Columbia, was one of the great engineering feats of the era.

The long grades up steep mountainsides were fraught with avalanches in winter, a problem only partially solved by building snowsheds over the track in the primary avalanche gulleys. Workers struggled to keep the snowsheds in repair and to keep the track clear from snow in dangerous conditions—hundreds of workers were killed in avalanches. In one 1910 event, sixty-two workers clearing the track were suddenly buried and then frozen and suffocated under meters of snow.





The Glacier House in 1896 and later expansions (architectural model with train). The Guides Quarters is the building in the middle of the photo between the trees closest to the train line; staff housing is on the left.

High Angle Specialists

Specialist workers, adept with ropes and vertical positioning, were also employed. This type of skilled labor would have been instrumental for many of the new wonders of engineering in the late 1800s using steel, concrete, and rock anchoring techniques for civil projects of unimaginable new scales. In the Rogers Pass area, the work of creating and maintaining anchored foundations, cedar and stone-arch drainage culverts, and supporting pillars would have been difficult and dangerous skilled high-angle work in the steep mountain environment. Yet those heroes are largely forgotten, and the challenge of working with engineers to create structure and form are often taken for granted despite the frequency of accidents7. Some evidence suggests that stonecutters and high angle specialists were largely from Italy, and were later known to have helped build the elegant stone architecture of the region with Scottish stonemasons. Others were literally reshaping the terrain using high-pressure hydraulic systems to move vast volumes of earth. To maintain the railroad and its services, life would have been a constant multi-cultural bustle of a



Requiring over two million board feet of lumber to build and at 164\(^1\) in height and 1,068 long, no other structure on the original mainline compared in size to the Mountain Creek Bridge.

myriad of independently run large projects. The increasing tourism and expanding mining operations only added to the hubbub, and the internationality flavor of the "safe" spots, like Glacier House, an oasis surrounded by a hostile mountain landscape, was a favorite place for guests and employees alike.



HOTELS.

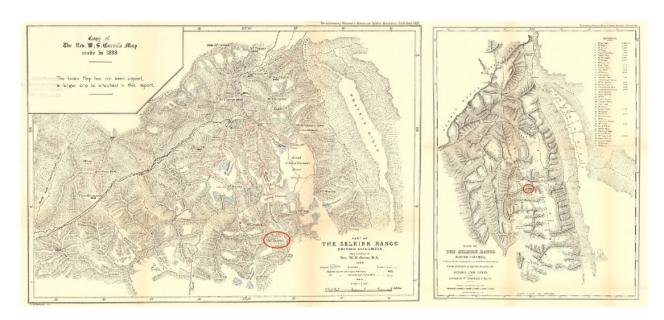
19

THE GLACIER HOUSE.

Within fifteen minutes' walk of the great glacier of the Selkirks is the Glacier House, at a station eighty-six miles beyond Mount Stephen. The popularity of this spot is such that the company has found it necessary to build a large annex to the original hotel, and it can now accommodate a considerable number of guests. Paths have been cut through the woods from the hotel to the edge of the glacier so that ladies and children may go up to its edge, and even upon the icy accumulation itself, without danger. Opposite the hotel is a lofty chain of the Selkirk range, of which the chief peak, the highest of the Selkirks, is Sir Donald. On fine days the top of this peak, as of its neighbors, shows clear against the sky, but its great altitude involves its frequent eclipse by passing clouds. Its disappearance and reappearance, however, only adds to the effect of the view that is obtained from the verandah of the hotel. This, too, is a hunter's base, for Bighorns and mountain-goat and black bear.

Early Canadian Pacific Railway tourist brochure.

⁷ Footnote: For example, two workers died in building the Stoney Creek bridge, which at the time was reported to be the highest timber bridge ever built. It was one of the first bridges to be replaced with a wrought iron bridge in 1894, then later with a steel bridge. The wooden brides were not only rickety but also prone to burning up in the frequent large-scale forest fires being set off both by natural causes and human disruptions.



Comparison of Green's Survey (1888) and Wheeler's (1905). Mt. Dawson is circled in red on both maps. Rogers wrote in 1881, "Although at this season the days were very long and we traveled from early till late, we were five days making sixteen miles and arrived at the forks of the lllecillewaet, which was the farthest point white men had ever reached".



The Glacier House (1886-1929)

To save the weight of pulling dining cars over the steep and twisting mountain tracks through the Rockies and further westward, the railroad initially installed static dining cars on scenic sidings along the line. These eventually morphed into dining lodges, then comfortable hotels. The Glacier House. three miles from Rogers Pass, was one of the first. An early manager of the Glacier House described it as a "resting-place" situated in the heart of the Selkirks. The hotel is built beside the railway, in a beautiful amphitheatre surrounded by lofty mountains. of which Sir Donald, rising 8,000 feet above the railway, is the most prominent. Northward stand the summit peaks of the Selkirks in grand array, all clad in snow and ice, and westward is the deep valley of the glacier-fed Illicilliwaet River, leading away to its iunction with the Columbia. The dense forests all about are filled with the music of restless brooks, which will irresistibly attract the trout fisherman, and the hunter for large game can have his choice of 'big horns', mountain goats, grizzly and mountain bears. No tourist should fail to stop here for a day at least, and he need not be surprised to find himself loth to leave its attractions at the end of a week or month."

The ease of access deep inside a mountain range and the comfortable base camp brought climbers from all over the world, and as more trains and trails were built. The early era (to about 1900) climbed the major peaks made more accessible by Green's survey in 1888—as far south from the Glacier House as Mt. Dawson.

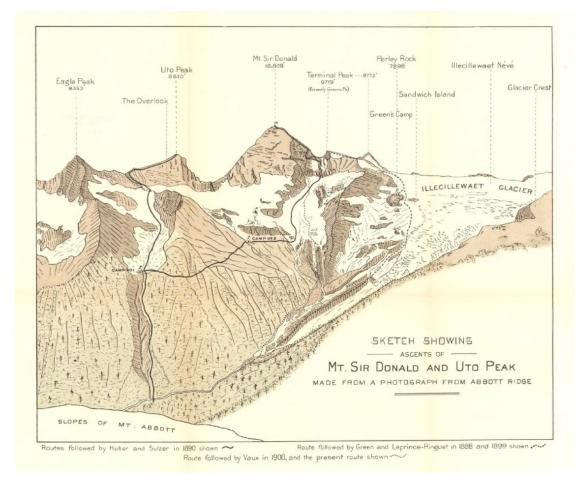


The Glacier House along Canada's first transcontinental railway near Rogers Pass in the Selkirk mountains was a comfortable basecamp for many mountaineering challenges.

Trip reports often began at Glacier House as starting point, e.g. Charles Thompson's report in the 1896 Appalachia of a trip with Fay and Abbott, "On Saturday morning, August 10, we left Glacier House by the Marion Lake path for the summit of Mt. Abbott. Our start was late (9.25), our plan indefinite." The report is followed by a description of the naming of the twin peaks of Castor and Pollux (the former noted as a rock climb) and an exciting high alpine traverse on the Asulkan Ridge. Despite major features already having local Indigenous names, most features were renamed by the surveyors and climbers at this time, though a few names survived, such as the Asulkan ("wild goat") Valley and the Illecillewaet ("swift water") River.

Starting in 18978, the railroad began contracting seasonal mountain guides from Europe to run excursions from its hotels. The guides were provided their own building

⁸.Footnote: Finch (1987), records that Peter Sarbach from Switzerland, who had been a carrier for one of Whymper's Matterhorn attempts, was the "first professional guide" for the CPR and arrived in 1897 for a single season. In 1899 Edward Feuz and Christian Hasler were hired as guides for the Glacier House.



Mt. Sir Donald and Uto Peak route "topos" produced by the typographer A.O. Wheeler.



Another amazing Wheeler map of the Canadian Rockies and Google Earth view of peaks marked.



Mount Sir Donald, climbed in 1890 by two Swiss alpinists Emil Huber and Karl Sulzer, was initially the main mountaineering attraction in the area and could be seen from the Glacier House. The surveyor A.B. Rogers called it Syndicate Peak but it was later officially renamed by the Dominion of Canada for Donald Smith, co-founder of the Canadian Pacific Railway and principal shareholder of the Hudson's Bay Company, originally granted trading monopolies over vast areas of Canada by King Charles II in 1670. Courtesy Whyte Museum, Society of Alberta.

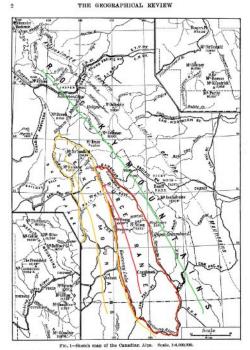
and were hired out for \$5 per day from the Glacier House, leading tours for both hikers and climbers to glaciers and summits. At its peak, the Glacier House had close to one hundred guestrooms and a half-dozen outbuildings for guides and other employees. By 1903, running water and a sewer system, electricity, steam heat, an observation tower, billiard rooms, and a bowling alley were fully installed. In 1904, A.O. Wheeler, a frequent resident of the Glacier House, described it as "most luxurious and homelike— fitted with every modern accessory to comfort.")9. Huts were also being built further afield in the surrounding mountain ranges. Quicker access to the mountains was increasing.

If there was ever a "golden age" of climbing histories (and there are many), the wave of climbing made possible in Canada by new trains and trails, with the centerpiece Glacier House, where all great mountaineers would spend some time, would be one of them. The Wheeler survey (1901/2) extended access to the range further south, and as Charles Fay notes in the 1916 Geographical Review, by 1908 "a new epoch for this region began".

⁹ Footnote: For his surveys, Wheeler often base-camped his team at nearby Roger's Pass, which started as a bustling trading post, but was then abandoned by 1887 due to avalanches and then only used in summer. In the 1915 Glacier House season, at its peak, nearly 13,000 people registered, in addition to countless day visits from travelers on the train. In 1916 the Connaught Tunnel was carved, bypassing Rogers Pass and the Glacier House, and from 1916-1925 the Glacier House only averaged 3000 overnight guests per year. The hotel officially closed in 1925, but guides were still permitted to use it as a basecamp for a while. The hotel was demolished in 1929. (Finch, 1987).

BUSH PEAK	51 50	111	10	10,800		[UNCLIMBED.]	C., pp. 198, 227. (Mention of naming.)
CATHEDRAL	51 24	110	23	10,454	1901, Acc. 26.	OUTRAM (BOSSONEY, KLUCKER).	O., p. 172.
Силил	52 - 15	117	50*	10,200*		HAREL, D. CAMPBELL.	App. x., p. 35.
CHANCELLOR	51 14		i 30	10,751		OUTRAM, SCATTERGOOD, WEED (HÄSLER).	O., p. 260. App. x., p. 16.
CLINE	52 - 05		45	11,000C		[UNCLIMBED.]	C., p. 306. (Mention of naming.)
COLLIE	51 37	1	35	10,315		OUTRAM, WHYMPER (C. KAUF- MANN, KLUCKER, POLLINGER).	O., p. 221.
COLUMBIA	52 02		28	12,000		OUTRAM (C. KAUPMANN).	O., p. 376. App. x., p. 142.
CONSOLATION	51 50	111	14*	11,2000	1902, Aug. 19.	OUTRAM (C. KAUFMANN).	O., p. 367.
DALY	51 31	1	33	10,382		BATCHELLER, FAY, TEWES (C. BOHREN, C. HÄSLER).	App. x., p. 374. D. and Ö, Z. xxxvt., p. 153.
DELTAFORM ("SAKNOWA")	51 18	110	3 14	11,225	1903, Sept. 1.	EGGERS, PARKER (C. AND H. KAUFMANN).	App. x., p. 295.
DIADEM	52 16	1	7 31	11,500C		COLLIE, STUTFIELD, WOOLLEY.	C., p. 128. A. J. xix., p. 262, 461. G. J. XIII., p. 351.
DOME, THE	52 - 04		7 21		1808, Aug. 21.	COLLIE, STUTFIELD, WOOLLEY.	C., p. 121.
Douglas, No.	51 37	11	5 58	11,015	1907, SEPT.	L. M. EARLE (E. FEUZ, SR., AND G. FEUZ).	C. A. J. 1., p. 318.
Douglas, So.	51 36	111	5 58	11,220	1910, July 12	J. W. A. HECKSON (E. FEUZ AND E. FEUZ, Jr.)	С. А. J. III., No. 1. Арр. хи., No. 3.
Enex	52 16	: 117	51*	10,660*		[UNCLIMBED.]	App. x., p. 35. (Partial ascent by Habel.)
EIFFEL ("SENTINEL")	51 20	110	14	10,001			(Climbed previous to Aug., 1903. No data.)
FAY ("HEEJEE")	51 18	110	00	10.612	1904, July 20,	BENHAM (C. KAUFMANN).	А. J. ххи., р. 333.
FIVE, PEAK	51 18	110	12	10,018			
FORRES	51 51	110	51	12,000	1902, Aug. 10.	COLLIE, OUTRAM, STUTFIELD, WEED, WOOLLEY (C. AND H. KAUPMANN).	C., p. 277. O. p. 345. A. J. XXI., p. 369. G. J. XXI., p. 491.
FOUR, PEAK	51 18	110	i 11	10,028	1901, July 24.	LITTLE, THOMPSON, WEED (H. KAUPMANN).	App. x., p. 92. (Doubt expressed as to name.)
FRESHFIELD	51 45	11	5 57	11,000	1902, Aug. 4.	COLLIE, OUTRAM, STUTPIELD, WEED (C. AND H. KAUPHANN).	C., p. 206. O., p. 321. A. J. XXI., p. 367. G. J. XXI., p. 488.
GLACIER PEAK	51 21		3 16	10.831		FYNN, HART, RICHARDSON, WILSON	C. A. J. II., p. 84. A. J. xxv., p. 82.
GOODSIR, No.	51 13		5 24	11,555		FORDE, P. McTavish (E. Feuz, Sr.)	C. A. J. II., p. 61.
Goodsir, So.	51 12	11	3 28	11,676	1903, July 16.	FAY, PARKER (HÄSLER, C. KAUF- MANN).	Арр. х., р. 285. С. А. J. г., р. 72.
GORDON	51 36	110	3 30	10,3595	1907, Acs. 9,	BAKER, COLLIE, DIXON, FAY, MICHAEL, NOVES, PARKER, THOMISON, VANDERLIP (SAR- BACH).	С., р.28. А. J. хіх., р. 97. Арр. vін., р.394.
HABEL ("HIDDEN")	51 35	110	5 36	10,361	1901, Avo. 10.	OUTRAM, WHYMPER (BOSSONEY, C. KAUFMANN, KLUCKER, POL- LINGER).	О., р. 210.

Whymper's climbs with his Swiss guide Christian Klucker in Alpina Americana (Fay, 1911). Peaks "unclimbed" noted.

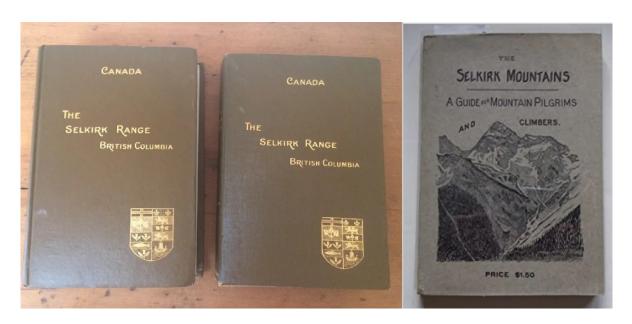


The Insets show in greater detail the Solikirks (upper right) and the Rocky Mountains (lower left where they are crossed by the Canadian Fractific Ballway.

Note: The attributes of N. 2000 and the Canadian Fractific Ballway.

Note: The Statistics of N. 2000 and the Statistics of N. 2000 and 1975 w. 2000 and 197

Geographical Review (Fay, 1916)



Early North American climbing guides: A.O. Wheeler guides to the Selkirks. Left: THE SELKIRK RANGE, BRITISH COLUMBIA (2 Volumes), published by Government Printing Bureau, Ottawa, 1905. Right: The Selkirk Mountains A Guide for Mountain Pilgrims and Climbers, co-written with Elizabeth Parker and published by Stovel Company, 1912

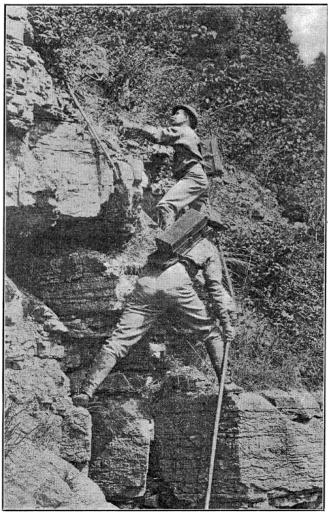
Arthur O. Wheeler Topographical Surveys

"Unless you know devil's club and the jungle mixed with its forests you know nothing of trailless travel in the Selkirks" --A.O. Wheeler

A.O. Wheeler, a talented surveyor/ mapmaker and mountaineer, published a comprehensive survey and guide to the known history of the Selkirks in 1905, using a relatively new topographic map method using stereographic photography, an efficient process that captured the required data in the short summer surveying season which could then be processed over the winter months. In addition to detailed topographic maps, Wheeler documented everything else known about the region and was one of the first mountaineering guidebooks in North America¹⁰.

Today, well-traveled trails lead everywhere in the Selkirk and Purcell ranges, but back then, the biggest impediment to accessing the mountains was to first establish a path through the thick and tall vegetation which blocked all view. Wheeler reports, "The devil's club (prickly aralia) may be numbered by millions and they perpetually wounding us with their spikes, against which we strike continues falling incessantly."

As pretty much everywhere in North America, the early surveys followed Indigenous paths, often employing guides



Topographical Surveyor's taking their instruments up a Mountain

from the local tribes, and the first mountains to be climbed were those with the least vegetated paths leading above treeline, or those that already had a hunting or fishing trail leading close to the mountain. The true challenge of these peaks was the difficulty

¹⁰ Footnote: Wheeler's book, <u>The Selkirk Range</u> (1905) also documents all known climbs and summits, even a chapter to "Lady Mountaineers in the Selkirks". Interestingly, Wheeler reports that Edward Whymper, who would have been in his 60s at the time, was at the same time also hired in the Rockies to "conduct explorations and surveys in the interests of the Canadian Pacific railway company". It sounds more like a climbing trip, though. Fay reports Whymper made "many interesting trips, including several first ascents", with his four traveling guides, Joseph Bossoney, Christian Kaufmann, Christian Klucker, and Joseph Pollinger—though only two (Mt. Habel "Hidden" and Mt. Collie) are listed in Fay's 1911 Alpina Americana monograph.

of getting there¹¹. For example, during several weeks of the toughest mountain work, Green's survey expedition only documents a point less than seven miles from the railroad. In one particular section, it took "seven hours of hard work (for) only one mile and a half through the tangle" (about 300m per hour). Mountaineers needed help. Wheeler writes, "To those journeying through the mountain wilds, the difference of an Indian trail and no Indian trail becomes very apparent."¹².

With help from Indigenous local guides, Wheeler and his team extended access much further with more and was able to map and provide access to a huge number of summits. Konrad Kain, after a hard season of guiding at Lake O'Hara on the Alpine Club of Canada's 1909 summer camp, writes of the summit view from Mt. Sir Donald (which he climbed on one of his few days off), "Unnumbered peaks and glaciers lie spread before the eye. With a good glass one could easily count more than a thousand peaks." Not just access, but Wheeler provided one of the most enticing climbing guidebooks ever published, with detailed information and beautiful illustrations.

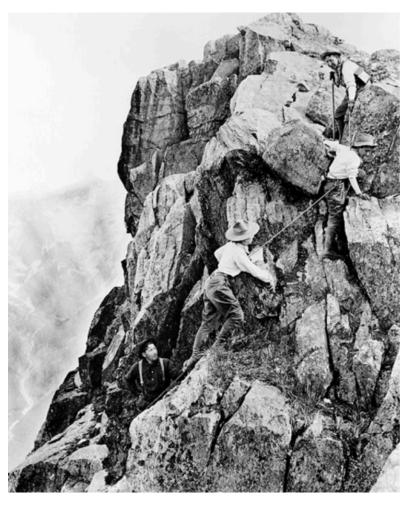
11 Footnote. On his first expedition in 1881, Major Rogers hired ten "strapping young Indians" from "Chief Louie" (see below) with an "ironclad contract" of \$1 per day (four shillings) for trailblazing and portering 100-pound loads for 20-minute runs with 5-minute rest in-between, with forfeited wages and 100 lashes as penalties. Grohman, a member of the Reverend W.S. Green's survey in 1888, notes that the people from the local tribes were "no good on ice and won't go on it" (but who would with 60-100 pound packs and no nailed boots?) but their skills for finding and blazing trails in their traditional hunting grounds was legendary. Grohman writes further of the men picked as porters and guides from a tribe of the 'Lower Kootenay Indians': "White porters require so much for their own comfort in the shape of blankets and food and are generally so unused to it, that they can pack but little besides their own outfit, while one of these extraordinarily hardy and frugal Kootenays, with nothing but a breech-clout and an old goatskin of his own to carry, will, with a 60-pound pack on his back, walk and climb away from an average mountaineer, while, unburdened with aught but his own outfit of ounce weight and his "fire-squirt" (rifle), I will back a Kootenay to beat by miles, in a long day's climb, the best white mountaineer Switzerland or Tyrol ever turned out; and I am speaking with a twenty or more years experience in the Alps." See also Fay's description in 1916 Geographic Review. About "Chief Louis"-- Various heads are recognized with English names in the treaties at the time. An 1895 treaty with the Nakoda ("Stoney Indians") list the main chiefs in the region as Chief Abel and Headman Pielle (Kootenay), Chief Pierre Kinbasket and Second Chief Charlie Kinbasket (Shuswap), and Chief John Cheneka and George Crawler (Stoney) in an agreement structured by the Northwest Territories Commissioner of Indian Affairs regarding each tribes hunting ground boundaries.

12 Footnote. Full quote: "Nor must it be overlooked that most of the early traveling in these regions was by paths and trails previously mapped out and traveled by the Indian inhabitants, their lines of communication when passing to and fro on hunting expeditions. The Indian applies his natural ability in this respect in a wonderful manner and, as a rule, his selection of routes is seldom at fault. They furnish fair samples of engineering skill, while his knowledge of topographical formation, in which he is silently trained from his earliest youth, enables him to see at a glance the proper place to look for a road. With, possible, the exception of the Kicking Horse pass, it is likely that the passes entered and recorded by Sir George Simpson and Capt. Palliser's parties were traveled Indian routes. To those journeying through the mountain wilds, the difference of an Indian trail and no Indian trail becomes very apparent." (A.O. Wheeler, The Selkirk Range (Ottawa: Government Printing Bureau, 1905). Another tale of Devil's Club: "Travelling is very difficult, owing to the thick growth of willows, scrub maple, juniper and devil's club. Devil's club! What an experience is devil's club! Imagine a bare stick an inch thick and five to eight feet high with a spread of tropical-looking palmated leaves at the top, set off by a bunch of bright red berries. The entire surface of the stick is covered by sharp, fine spines and the canes grow so close together that sometimes it is impossible to force a way through them without using an axe. The points of the spines break off in the flesh..." (Wheeler, 1905 and 1912).

With increased access through the bush, and the information shared by Wheeler, the Selkirks became a hot spot—first ascents with the opportunity to (re)name your conquest ¹³were there for the traveling, and climbers from Europe and the East Coast flocked to the region, often with their own "Swiss Guides".

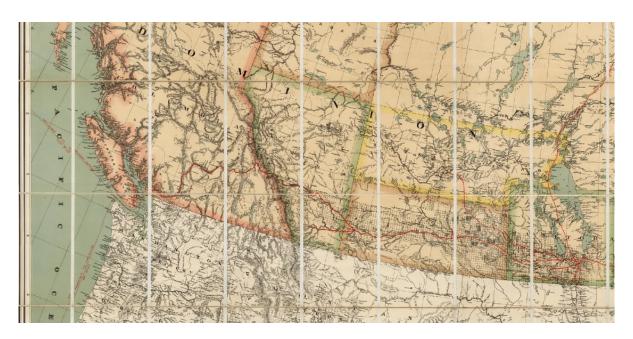
At this stage, nearly all "modern" North American climbing was the double-guide method perfected in the Western Alps. Clients often went with small parties, with dedicated guides in the back and in the front as a continuously roped party. Their role was to keep clients safe and also to cut steps up steep icy slopes, sometimes ahead of time in preparation for the client's ascent. As in Europe in the mid-1800s, the concept of "quideless mountaineering" was discussed and sometimes practiced, but most respectable ascents involved the safety of guides. Gear was hard to come by; Wheeler notes in 1905 that "alpenstocks, ice-axes, rucksacks, rope, and all other adjuncts of the mountaineers personal outfit much be brought from Europe or in the large centres of the United States, for at the present time there is no special

manufacture of these in Canada, and such as are made are not reliable." Many climbers of the day went to Europe to first get outfitted and climb famous peaks like the Matterhorn with Swiss guides before venturing into the Canadian mountains, sometimes bringing the same Swiss guides.

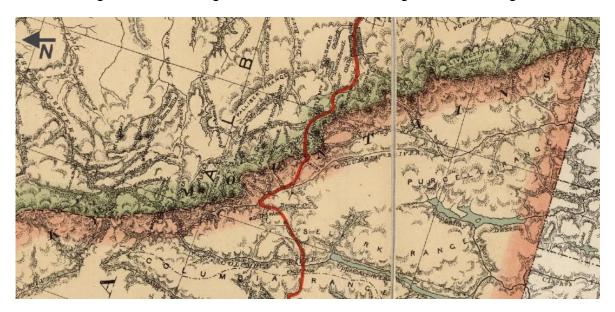


The Swiss roping method with two guides--one in the front, and one in the back (as the belay anchor), ready to offer assistance with the rope to safely guide small groups of clients to rocky summits.

¹³ Footnote: mountain "conquest" has been covered previously, also to note is the concept of "discovery" of places inhabited for generations, such as the 'discovery' of Yosemite Valley in 1851, and the celebrated 'discovery' of great Takakkaw Falls in Yoho Valley "which rivals the Yosemite in height and surpasses it in volume" by Jean Habel, the German traveler of some note, in 1897 (Fay, 1911).



1886 map of the Canadian Pacific Railway (red line: "In operation and under construction"). Johnson & Edmonds, Burland Lithographic Co., Montreal. It was the longest railway in the world at the time. Note the surveyed land blocks along the line ("not to exceed twenty miles on each side of the line") which were granted to the railroad barons in exchange for building the railroad along with other timber and mining exclusives along the line.



Close up of 1886 railway map(north to the left) showing Rogers Pass, close to the site of the original Glacier House. The Purcell and Selkirk ranges to the south were by and large "blanks on the map". The mountains west of the Rockies were sometimes known collectively as "the Gold Ranges" (Fay, 1911) The green/pink shaded areas are the Canadian Rocky Mountains, the Selkirks/Purcells are an older mountain sub-range to the west. If you love maps and the origin of the names of ranges, see: Exploring the history of place names in the Windermere Valley.

Alpine Club of Canada

In 1906 Wheeler with Elizabeth Parker founded the Alpine Club of Canada (ACC) with its clubhouse in Banff, and Wheeler became its first president and began his long-term editorship of the Canadian Alpine Journal, first published in 1907. By 1911 the club had 600 members (over 200 women), and Canadian mountaineering in the finest of British tradition had arrived on the continent. The same momentum was building in New Zealand, as well as in other regions of the British Empire. One of the missions of the ACC was to connect and share information with international alpine and geographical associations, and Wheeler became a lead player in the global community of alpine club members, all seeking to ascend and document the mountains of the world. Wheeler was now looking at expanding the ranges of mountaineering and began organizing summer camps in the Canadian Rockies, sometimes referred to as the "Alpine Club of Canada Expeditions." Two guides from the Glacier House were hired, and all sorts of participants, including many in their quest to become "active Members" of the ACC (requiring an ascent of a 10,000-foot peak) and who first learned of modern mountain climbing techniques from qualified European guides.

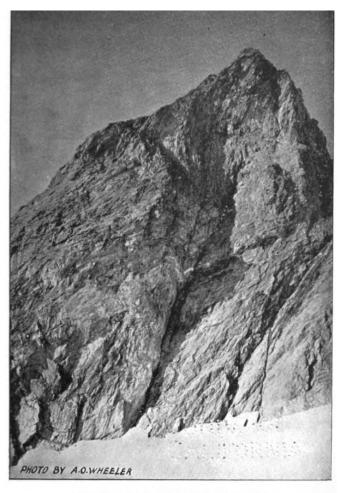
While planning the 1909 ACC summer camp in the Rockies' expanding national park areas (now Yoho and Banff NPs), Wheeler received a letter from Hofrat Dr. E. Pistor, an important member of the Board of Trade in Vienna and member of the Austrian Alpine Club; Pistor had climbed all over the European Alps with his guide Konrad Kain

and was a well-respected mountaineer. 14 Guides back then were rarely offered membership in the alpine clubs but Pistor had become good friends with Kain and went to bat for him. Kain had applied for a 1909 season guiding job at the Glacier House, but was unsuccessful as the established Swiss Guides were all returning for the season. The timing of Pistor's letter of recommendation to the Alpine Club of Canada was right (and perhaps Wheeler was looking for a rock climbing specialist), and he offered Kain a guiding spot for the upcoming ACC summer camp for \$2 per day, all expenses, plus another \$2 for mountains climbed. Kain went on to become one of the great heroes of early North American climbing, well-known and respected for his quality mountain guiding, hard-working spirit, and alpine & technical rock-climbing breakthroughs. He was the first to bring Eastern Alps rock climbing techniques to the 'west'.

The story of Conrad Kain (1883-1934) has the flavor of a Canadian 'Horatio Alger' tale—the oft-told timepiece saga of successful mentors who recognize talent, and the neophyte who makes his way and seizes opportunities; through hard work, the individual 'rises' to find success. In this regard, Wheeler was one of the most influential in Kain's 'rise', providing him multiple opportunities that would have been otherwise inaccessible.

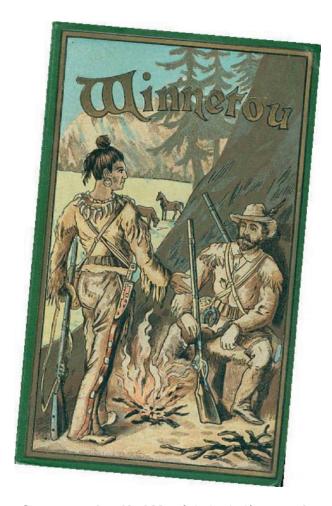
In the years preceding and during WWI, there is very little information shared between the English (and French) alpine clubs, and alpine clubs from the 'Triple Alliance' (German, Austria-Hungary, and

¹⁴ Footnote: From a footnote in Robinson, 2014 (ref.below): Earlier in the year, Pistor corresponded with both the CPR and the Alpine Club of Canada (ACC) on Kain's behalf to inquire about employment for him as a guide. "Conrad is not only a good, competent man," Pistor wrote, "but a first-class guide and exceptional because he is just as good on rocks as he is on glaciers. He is clever and sympathetic too, he is a 'gamin' with people who like dangers, and careful like a father of 50 with people who are in want of care. Erich Pistor to Arthur O. Wheeler, ACC President, 9 April 1909, WMCR M200/ACOM/52. Pistor's letter to the CPR was dated February, and the letter to the ACC dated April 9.





Wheeler (1912): "Twisted Rock named for its strangely contorted strata. Altitude: 9,345 feet. The interior convulsion of the earth that upheaved this rock has caused the sub-strata of which it is composed to twist in an almost complete circle. The height is a little over 1,000 feet."



German author Karl May (1842-1912) created a mythical view of the American West (which he never visited) that still permeates stereotypes today. His famous character Old Shatterhand had a silver rifle.

K

Kain, Konrad, Swiss guide, 19-36, 134-153. Karmak ranch, 19, 133. Kashmir, 101. Keen, Dora, observations in Alaska, 60. Kelsey, H. P., acknowledgments to, 198. Kendall, E. A., 370. Kennedy, Sinclair, shows photographs, 86;

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Lowell, James Russell, visits White Mts., 382.

Lowell, Percival, elected president, 104; death announced, 108; obituary, 179.

Lunkasoo, 354.

Lyell, Sir Chas., visits White Mts., 175.

Kain, born in the lower Austria/Styria region, was listed as a "Swiss Guide" in the index of the 1916 Appalachia (until 1911, he spelled his first name with a K). At his first camp in Canada, he was addressed as a Swiss guide (ref:Letters). In an obituary notice decades later, he was noted as "one of the first Swiss guides brought into this country by the ACC" (Cranbook Courier).

Italy—the latter a "neutral" member until 1915), and climbers from these regions were rarely acknowledged outside of the Eastern Alps. Of course, the Eastern Alps by this time is where new lightweight technical rock climbing techniques had already advanced beyond anywhere else in the world, and even though such techniques were disdained by the mountaineers in the British Empire at the time, Wheeler must have known that hiring an Austrian guide, known for his rock climbing skills, would have some implications, as there were plenty of recognized traditional and broadly accepted mountain guides from Switzerland looking for the opportunity to work in the Canadian mountains.

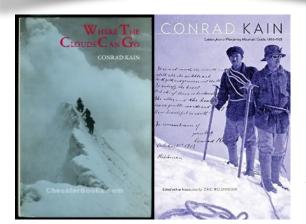
Indeed, Kain had to pretend to be a Swede to get to America, and once in America, he was introduced as a "Swiss Guide" despite his Austrian roots. On the other side of the "pond", western North American stereotypes mythologized by the German writer Karl May, initially ingrained in Europe and eventually spawning countless "spaghetti Westerns", influenced the mythology of the wild wild west even in North American culture.

It is only in this context of technological changes providing increased access, and the indigenous and international cultural stereotypes (some that persist today) that can we understand Kain's contributions to climbing, and how he became the most successful international guide of the era. Before we consider what Kain brought to North American mountaineering, it's worthwhile to look at his humble beginnings. Conrad Kain's story will be told next in "Trains and Kain (part 2).

REFERENCES

- •For an excellent overview of early mountain climbing in North America, see Ways to the Sky, A Historical Guide to North American Mountaineering, by Andy Selters. Ways to the Sky, 2004
- •For Canada history, Chic Scott's Pushing the Limits (2000) is unmatched.
- •Roof of the Rockies, W. Bueler (2000)
- •Yankee Rock & Ice, Laura and Guy Waterman (1993)Trains and Kain (Canada climbing to 1916, part 1)
- •A History of the Canadian Pacific Railway in Glacier National Park, British Columbia 1884-1930 by David A.A. Finch 1987.
- •Snow Wars, An Illustrated History of Rogers Pass Glacier National Park, B.C, John Woods, 1983
- •sRecent Mountaineering in the Canadian Alps, Geographical Review Vol. 2, No. 1 (Jul., 1916), Charles E. Fay
- •Alpina Americana (first three publications covering the Sierras, Canadian Rockies, and Alaska from the American Alpine Club)
- •for next chapter:
- •Where the Clouds Can Go, Conrad Kain and J. Monroe Thorington, 1954 (reprint from 1935 edition).
- •CONRAD KAIN: LETTERS FROM A WANDERING MOUNTAIN GUIDE 1906-1933 Zac Robinson 2014. An excellently presented book, with well-researched footnotes, of discovered letters, lost since 1935, of Conrad Kain to Amelie Malek and family.

Author's Note: This article is informed by Chic Scott's Story of Canadian Mountaineering, with its broad well-researched history, but also inspired to go a bit deeper in what Brian Greenwood writes in the introduction: "When I think about Canadian climbing, I like to think of the pioneers. With the railways for many years the only access to the mountains, ... Just getting to the base of most mountains in the early days involved trail building, bushwhacking, pack trains, often major expeditions." I loved taking the old steam train to access the the San Juans, and when I climbed in the Purcells in the 1990s, I could only imagine the increased difficulty back then to get into the range, then so it has been fun to research the progression of technological changes. An early, "how do you get the rope up there?" kind of question.





Map of south central Alaska from American Alpine Club's Alpina Americana (1914).

Trains and Kain (part 2)

Summary: focus on Konrad Kain's early life and use of climbing tools and techniques in the Alps prior to his life and sharing of Eastern Alps ideas in North America.

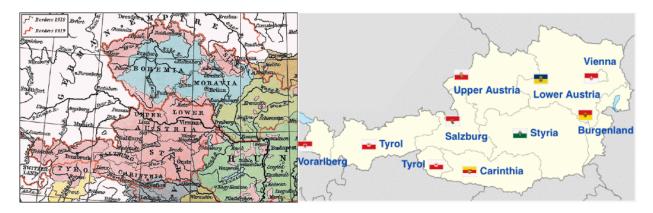
Introduction

In 1935, J. Monroe Thorington (1894-1989), a prolific historian and editor of the American Alpine Club Journal from 1934 to 1946, published 500 copies of Where the Clouds Can Go. a collection of essays written by the internationally renowned mountain guide Conrad Kain (1883-1934). Kain elegantly captured many of his climbing experiences on paper while he was actively guiding; some he had submitted to periodicals, but most were just filed away or passed to a friend. Thorington had climbed with Kain for six seasons in the Canadian Northwest, and knew him well. After Kain's death, Thorington was able to collect Kain's writings from "broken diaries and scraps of paper in a dozen countries of the world," which he chronologically interspersed with his own articles well researched from Kain's letters, notes, and other sources, including many personal recollections, to create the classic climbing book. Where the Clouds Can Go 15.



Where the Clouds Can Go (1954 reprint) begins with this picture of Conrad Kain in New Zealand.

¹⁵ Footnote: A major source of Kain's life and climbs were over a hundred letters Kain wrote to Amelie Malek, a client whom he had guided in 1906 and became a lifelong penpal and family friend. Thorington used the letters to fill many of the details of Kain's life and climbs in Where the Clouds Can Go; but after publication, the original letters were lost. In the 2001 Canadian Alpine Journal, Chic Scott wrote that the "greatest Canadian mountain mystery is what happened to Conrad Kain's letters, journals, and diaries. These are perhaps the greatest single treasure in Canadian mountaineering, and they seemed to have disappeared." Around the same time, Gerhard Pistor, on a tourist visit to Banff, had seen a picture of Conrad Kain on a tourist visit to Banff and remembered that his father, Dr. Erich Pistor, had told him of Konrad Kain. He visited Don Bourdon at the Whyte Museum, who knew exactly what material might be out there, and Dr. P's (as Kain wrote of him) archives found their way to the museum in 2005. Pistor had intended to write a book about his former guide and had obtained copies of the letters from Thorington after he had completed Where the Clouds Can Go (the letters had been painstakingly typed up by Amelie after Kain's death to share with Thorington). These letters are now published in Zac Robinson's Letters from a Wandering Mountain Guide (2014), an excellently presented and footnoted book. No doubt further insights of this remarkable climber remain to be discovered in the Whyte Museum of the Canadian Rockies.



Maps of Austria for context. Conrad Kain was from the area near Vienna, in Lower Austria, near the border with Styria, a major European mining area.

Kain's engaging autobiographical tales and personal letters not only present an amazing climber, but also a great illustration of the professional mountain guiding of the era. Conrad Kain's history provides a further glimpse of how the steep multi-pitch rock-climbing techniques that originated in the Eastern Alps spread and transferred to the rest of the world, new ideas that are core to how long routes are climbed to this day.

Hunger map after the "Great War".

Konrad Kain—from tramp to international mountain guide

Konrad Kain had a rough start. His father, an Austrian miner, died when Konrad was nine years old; his kind mother destitute¹⁶. In the early 1900s, Austria-Hungary was in the dying throes of its dual monarchy and was a time of rising nationalism, proxy wars, and harsh economics.

Kain's home village, Nasswald, is nestled in a valley in Rax mountains, a small but rugged range in the farthest north corner of the European Alps. Just east, the Alps flatten at Vienna and then onto rolling hills until the High Tatras rise. Growing up in the Rax, climbing was a natural way of life; the Alpenstock and decent boots were first child possessions. After finishing school at age 14, he lived in the mountains for a year tending goats, worked as a miner for a while, then left home at age seventeen and "unexpectedly found himself on the road as a tramp."

¹⁶ Footnote: The mining town Hirschwang, where Kain lived and worked as a quarryman, is just up the valley from Reichenau an der Rax. Mining in Lower Austria and Styria goes back over 3000 years, primarily iron and copper. According to Hauswirth (1989) the mines around Hirschwang had an average iron ore content of 34%, and 4.5kg copper, 201g silver, and 6.3g gold, but smaller remote mines like the ones in the mountains around Hirschwang were mostly becoming un-economical by Kain's time. Regarding the spelling of Conrad with a K: In his letters to the Malek sisters (reference below), he used the Konrad spelling until about 1911. When he became a Canadian citizen in 1912, it was Conrad with a "C". So in this recounting of his story, I will use a K in reference to his adventures to about 1911, and Conrad with a C thereafter.





Left: The typical goat herding environment in the Raxalpe during Kain's era. Right: Quarrymen and their tools in the Neunkirchen mining district, the region where Kain found work. Kain's father was killed in a mining accident when Kain was nine.

In his writings, Kain recounts rambling on foot around economically depressed Austria as a teenager, finding only sporadic work, stealing bread to survive, and evading police. Vagrancy was illegal and Kain spent time in state work camps, doing hard labor in exchange for a temporary respite from the law, and bare rations. He was tough: with badly blistered feet, no socks, and worn-out boots, for three days Kain hobbled miles and miles on frozen roads seeking medical help, unable to work, and relying on the kindness of strangers and quick wit. Finally, hat in hand, Kain returned home broke and wounded both physically and mentally—"the whole village knew that I had been a tramp. Oh, how dreadful!", Kain laments. But the experience did not diminish his wanderlust.

A Mountain Guide Evolves from a Poacher (1903-1907)

Helping care for his mother and five siblings in Nasswald, Kain worked as a quarryman in the nearby mining town of Hirschwang until he was twenty-one. Wages were meagre, and he tried poaching for chamois in the Rax Alps to help make ends meet. Chamois (Gämse in German) were quite valuable for their skin and tufts, but hunting them was not only illegal but also quite dangerous. "It is impossible to go through a single day of real chamois-hunting without passing many hundred places in which one false step would be inevitable destruction," a hunter wrote in 1830. But a tuft of fur from a buck's

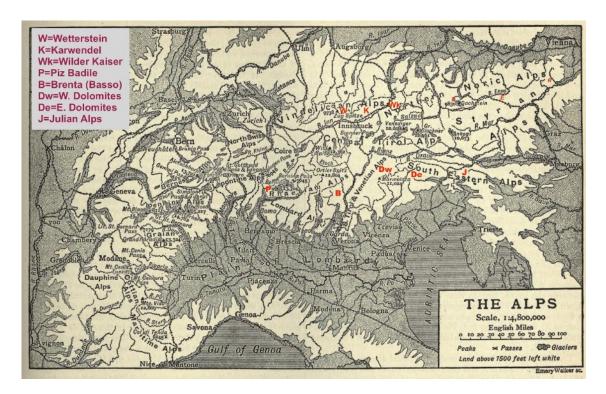


The Rax Alps near Kain's hometown Nasswald.





Chamois and their unfortunate hunter's prize.



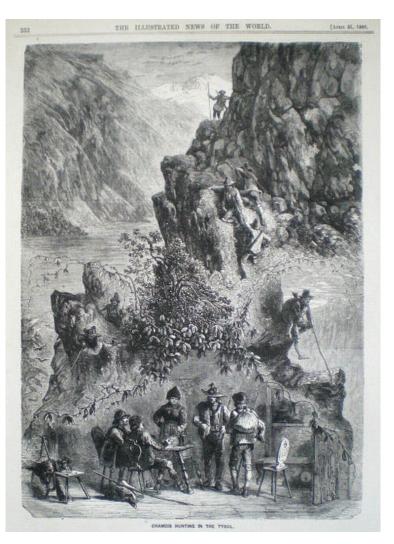
The Rax Mountains where Kain grew up are marked with an "R" on the far right. For two years as a teenager in 1902/3, Kain wandered in the Noric and Styrian Alps as far east as the Dachstein region (marked with "D") looking for work. By 1908, he had guided throughout the Alps and as far west as the Dauphiné Alps and south to Corsica (Emery Walker map, 1911).



Left: cigarette ad depicting a Chamois hunter. Right: Chamois in a mountain landscape. In medieval times, the Alps were sometimes referred to as the Gämsegebirge—the Chamois Mountains.

back was worth as much as Kain could make in two months of mining; the "Gamsbart"—the long black hairs of the male chamois were coveted decorations for the traditional felt hats of the region ("the bigger the Gamsbart, the greater the status").

Once plentiful, Chamois had been hunted to near-extinction in many Alp ranges and were protected by gamekeepers in Kain's time. Part of the mountain-goat family, the hooved chamois are quick to evade hunters by out-climbing predators on the steep cliffs of their habitat. Kain recounts stories of rock climbing and scrambling in the canyons around the Höllenthal ("Hell Valley") in winter, chasing chamois on his free Sundays, twice involving near-death experiences and the eventual loss of his catch through various mishaps¹⁷, all while traversing up and down treacherously icy cliffs. On his final attempt, descending at night, Kain fell off a cliff and then tumbled down a steep slope for some distance, "wordless with terror." Seriously injured, he crawled and hopped for hours in the dark to a tavern. Poaching was illegal, and he was grateful that the hospital in Reichenau recorded it as an "accident on the street" for his discharge certificate, thanks to a sympathetic doctor. Another close call for Kain's life and freedom but a good example: "Good judgment comes from experience, but experience comes from poor judgment". Though an unsuccessful poacher, Kain gained a taste for adventure and yearned for more "wanderings in the woods and rocks". In early 1904 he sold his gun and instead devoted himself to alpine sport for his quarrying days off, and soon became an accomplished alpine skier.



Chamois hunters were known for their climbing skills in the 1800s. The first climb Kain describes is a huge rock, topped with ravens which he hoped indicated a fallen male chamois, but after a hard and dangerous climb, he only discovered "an old doe! Scornfully I turned about, complaining that my trouble had been in vain. Hungry and thirsty I took the homeward way," he writes.

¹⁷ Footnote: It is unclear what happened to the Gamsbart from the last buck he shot, he reports skinning the buck, but then losing it in the fall at night. Kain later references searching and finding fallen bucks on his climbs, skinning and selling their valuable "beards".





The Viennese mountaineer and painter Gustav Jahn painted many scenes in the Rax alps, as well as the Gesäuse and the Dolomites before his death in 1919 on the Ödstein ridge in the Gesäuse. He often painted with Otto Barth, another great Alps mountain artist.

Watercolour | 76.2 x 101.0 cm (whole object) | RCIN 917108

Kain's Rax Alps Guiding

In his home area, Kain was a pupil of the decorated guide Daniel Innthaler¹⁸, who was noted in the 1902 German-Austrian Alpine Club (DuÖAV) journal as the "only suitable guide for really difficult tours" in the Rax mountains. Once the sole domain of goat herders and traveling tramps (the Archbishop of Vienna once said he could not conceive of "a lonelier and more horrible ...wilderness"), by 1905, over 15,000 people were coming to the Raxalpe for recreation. mostly from Vienna to climb established routes (DuÖAV). As elsewhere in the Alps, more and more mountain routes were becoming equipped with "security": ladders and anchored wire cables for the "high tourists", but there was also increased demand for roped climbing with local guides on the more technical climbs—there were fifteen routes of various difficulty in the Rax



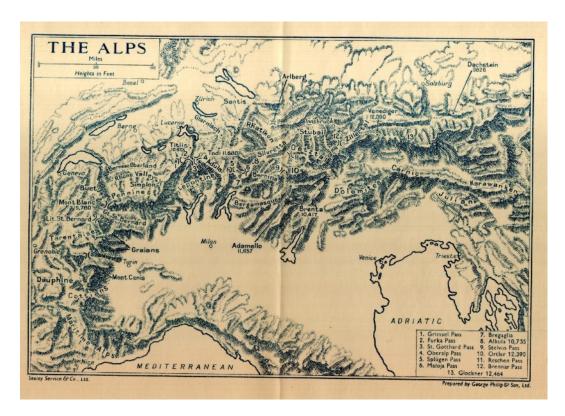
Gentleman and their laden guides.

at the time. Kain was well poised for this boom, and began his guiding career on his 1904 Easter holiday, by meeting tourists as they arrived in town, and inviting them up climbs. His first two days of guiding work earned him two weeks' quarrying wages. "I went every free day to the Höllenthal in order to learn all the climbing routes," after that, he writes.

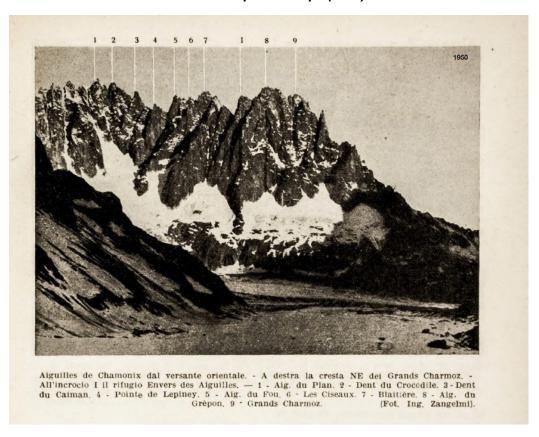
¹⁸ Footnotes: Daniel Innthaler of Nasswald (1847-1925) climbed many of the hardest routes in the late 1800s and was awarded the Cross of Merit in 1903 at the Reichenau Alpine Rescue Station for his zeal and dedication on rescue efforts in the Rax and Dachstein Alps. He continued guiding to an old age. Although Kain only writes of a few encounters with Innthaler (but noting that he was his pupil), Thorington notes that Innthaler was Kain's 'teacher'. Kain once wrote chapters of a story with Innthaler as a character (referenced in Letters, 1933) but it has been lost.

Regarding the fifteen routes on the Rax at the time, history on the old routes is patchy (current guide here) but Kain writes about a few: the Katzenkopf, Akademik, Quartette, and the Karl Berger route. Routes can be as long as 800m in this Northern Limestone Alp range. Kain climbed a difficult variation to the Wiener Neustädter Steig in the Rax. Karl Berger had first ascended some of the hardest technical rock climbing spires in the Tyrol and Dolomites; he is most famous as one of the first ascentsionists of the technical rock climbing breakthrough Campanile Basso in 1899. In the appendix, there is a postcard of Karl Berger on a steep rock climb possibly in the Rax Alps. Berger, like the great climber Hans Dülfer, was killed in WWI. Thanks to Mire Steinbuch for edits for this area.

A boom in guideless climbing was also happening in the Viennese Alps, prompted by the Naturfreunde (Nature Friends) movement, an environmental organisation started in 1895 in Vienna, with thousands of members, who sought to share their love of mountain recreation and to provide rescue services. Kain writes of his friend and Naturfreunde member Franz Hahn, who fell and died on a climb in the Rax: "Only those, who like poor Hahn, buried today, laying out his own hard-earned kreuzers for nature, and finding his joy in the mountains; only those can be called nature friends" (Kain was very cognizant of social/wealth divisions). From 1890, the Gebirgsfreund, (Mountain Friend) was a monthly from the Austrian Mountain Club based in Vienna with Mizzi Langer advertisements and Gustav Jahn illustrations; in its first issue, the editorial encourages alpine excursion in more distant ranges like the Ennsthal high mountains (~150km east of Vienna), which were "touristically" connected to Vienna via the "pleasure train of the Austrian State". Innovation was happening in Vienna.



Lonsdale map of the Alps (1934)



Grands Charmoz in the Western Alps, typical of many climbs Kain was guiding in the Western Alps: early morning ice approach, long steep rock climbs, then tricky descents with ever-present rockfall danger and fast changes of weather.

Four Tenets of Guiding

Learning from early epics with rockfall, dropped equipment, unplanned bivouacs, and wild weather, Kain polished his craft and soon became a sought-after guide, as well as a rock-climbing prodigy. Later Kain was to describe four points of confident guiding¹⁹:

- Never show fear.
- Be courteous, and always pay special attention to the weakest in the party.
- Be witty, and be able to tell convincing white lies at the spur of the moment.
- 4. Know when to show authority, and when the situation demands, to give a good scolding to those

Indeed, within a few years, he developed the qualities of an invincible outdoor guide through hard work, grit, "go-for-it", and learning from his epics. Kain felt these tenets critical to hold the confidence of any party, and helped him gain devoted clients and create partnerships on legendary mountain climbs all over the world.

who deserve it.

Kain's Clients and Climbs

In 1904, the wealthiest Viennese mountaineering "amateurs" were touring by automobile to alpine towns on new motor roads; patrons would contract local guides on planned trips to distant mountains. Guides would travel via train and foot, sleeping in guides' huts and or hotel stables, then meet their clients at resort hotels for the day's climb. Kain's guiding work in the European Alps was seasonal and remained a sideline to his quarrying job (when he could negotiate time off), but Kain was soon contracting guiding work all over the Northern Limestone Alps.

Kain writes of many clients only by initials: Mr. H, "one of the wealthiest in all Vienna" was a real stinker, shafting Kain on his wages and refusing to pay for his return travel, abandoning Kain far from home. He once got benighted on the Pfannl route on the Oedstein with Dr. B. who feared death and became irrational during a long cold



Hochtor and Planspitze around Gstatterboden.

¹⁹ Footnote: On my first time down the Grand Canyon rowing an 18' raft for two weeks with clients, my friend and mentor Roger Dale provided me with nearly the exact timely advice, learned from experience as a professional.

unplanned night perched on a ledge (Kain responded with tenet #4 above). He climbed a lot with Dr. B over the years, a very difficult client who often wanted to climb something too hard for him, then blamed Konrad if they didn't make it (once Kain had to haul Dr. B "almost two meters through the air!" on the Schmitt chimney on the Fünffingerspitze). But with each epic, his experience on how to safely handle situations in the vertical environment grew. He also developed an eve for a line, both for the approaches and for the often complex route-finding on the steep rock walls of the Alps. If he couldn't find a client, he climbed solo, taking rest days only for storms or injury²⁰.

One client, Dr. P (Dr. Erich Pistor, who later helped him land his Canadian guiding role) became Kain's prime guiding benefactor and with his wife Sara, both good climbers, toured all over Europe with Kain. Within a year of chopping his first step with an ice axe on an icy approach slope, Kain was guiding the most famous and feared peaks all over the Alps: the Matterhorn, Monte Rosa, Mont Blanc, Meije, Weisshorn, Barre des Écrins, des Grands Charmoz, and dozens of others in the years following. He was also meeting many of the established

Alps guides whilst traveling through all the cool mountain towns: Chamonix, Courmayeur, Zermatt, Interlaken, and others, and gaining a reputation of his own.²¹

Not only was Kain learning the art of safe alpine mountaineering, but was also becoming an expert rock climber and capable of efficiently guiding clients on the hardest technical rock climbs. As was the case with his later guiding in Canada and New Zealand, his primary business was guiding the highest and most famous peaks, but Kain writes most intensely about his steep rock days on the limestone walls and dolomite towers. He soon became a top-tier technical Eastern Alps rock climber, approaching the abilities of specialist rock guides like Tita Piaz from Pera, Franz Schoffenegger and Franz Wenter from Tiers (who often recommended each other when clients were looking for steep rock objectives in the others' areas). Let's consider a few of the climbs of Kain's experience.

²⁰ footnote: On days his clients were late or needed a rest day, Kain would be on the lookout for work found on the spot. On his first trip to the Ennsthal Alps (various spellings), seeing a team of two men and a woman who looked like climbers, offering to carry "the lady's rucksack" and following them up to the base of a wall. Then, in conversation about their ropework and their experience, further offered to lead the team up the route on the Hochtor. The climb was much harder than the team had imagined and were grateful for Kain's help and ropework. He was tipped twenty Kronen, about 10-days mining wages; it was the most money he had ever made in a day. Generally, he would try to solo each route prior to taking clients, but that was not always possible and led to some epics of route-finding and getting benighted (back in my day, spending an unplanned cold night half way up some climb was a rite of passage—on cliffs like Cathedral Ledges, Cannon, and even the Gunks (going for that one last climb and taking longer than expected), if you were not getting benighted every once in a while, you were not really going for it).

²¹ footnote: Kain got into a few fights with local guides, as an 'out-of-towner', but he also made good friends with many guides who were helpful in tips and information, (i.e. Schroffenegger, Wenter, Steiner, Müller, Zettlemaier, Schneeberger, Kaindl, Innerkofler, his "teacher" Innthaler, Piaz), as well as other luminaries who offered good advice, e.g. the eminent painter and illustrator Gustav Jahn and Franz Kauba, husband of the famous ski racer and outdoor shop owner Mizzi Langer (where Kain purchased his climbing gear and pitons). He was also noted by the highly regarded Vienna climbers Vineta and Alfred Mayer, whose two sons, Guido and Max, would soon be climbing the longest and hardest big wall routes in the Dolomites in the 1910s.

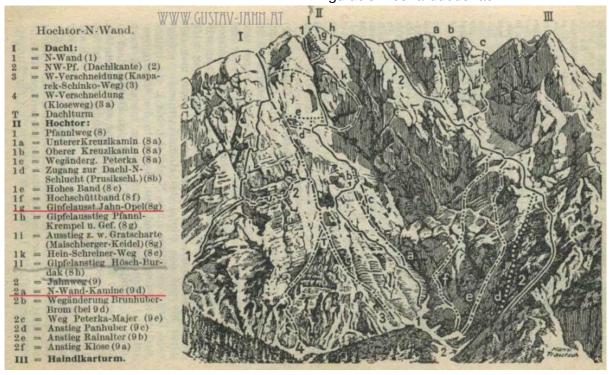
Onsight solo north wall of Hochtor in 6 hours (1904)

With only a few months of formal rock climbing experience under this belt, in the summer of 1904 Kain free soloed the north wall of the Hochtor, considered by the Tyrol climbers as one of the most difficult Eastern Alps 'tours'. The 1905 DuÖAV journal noted that Kain climbed it "in six hours from Gstatterboden!" (a rare exclamation point from the editors). Kain wrote, "One can only do it this quickly if one is alone. With one of two persons in addition there can be no fast going." Kain reports finding his way by following fixed pitons. He sometimes trailed a rope and "roped up" his rucksack on steeper sections. En route, he came to the

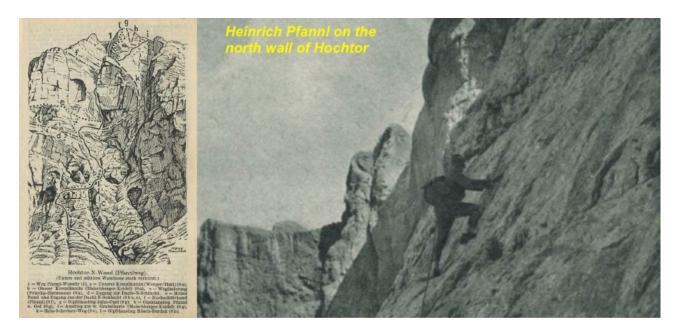
"Flying Ledge" where there were several pitons used for upward progress, but Kain said, "that did not seem so difficult for me."

Fast Zgimondyspitze ascent

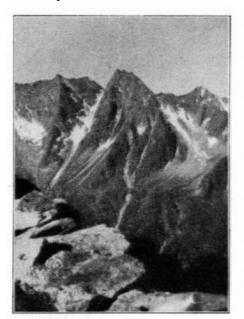
Back then as now, there were classic routes of repute that were rites of passage. One of the very first long modern granite rock climbs (1879) was the Zgimondyspitze, a centerpiece of the Zitterthal Alps and in 1904, a testpiece for multi-pitch rock climbers. Kain with Sara and Erich Pistor (Dr. P) climbed the route in an astonishing 32 minutes. Leading talented clients on technical ascents like these were more partnerships than the typical high-altitude (4000m) mountain tours, where tedious step-cutting up ice and snow was the guide's most arduous task.



North wall of Hochtor in the Gesäuse (Ennstal Alps). The Ennstal Alps were one of the early areas in Europe where pitons were used for alpine rock climbing in the late 1800s. The Pfannlweg is the zig-zaggy line marked #1 in middle. Kain first soloed the north wall of the Planspitze via the feared chimney first ascended by his mentor, Daniel Innthaler, nearly 20 years prior, and became an entry-level route to the steep walls in the Ennstal. #2 is the Jahn-Zimmer, which became (and still is) the most classic line up the north wall of the Hochtor.



Pfannl on the north wall of the Hochtor, a bold early "big wall" climb in 1895. Their trip report reads: "On October 11, Theodor Keidel, Thomas Maischberger, Dr. Victor Wessely and I climbed the Hochthor, the highest peak in the Ennsthal Alps, via its terrible, forbidding north face. The tour is by far the most difficult in the Ennsthal. The crashes (fall potential) are really terrible.— Dr.



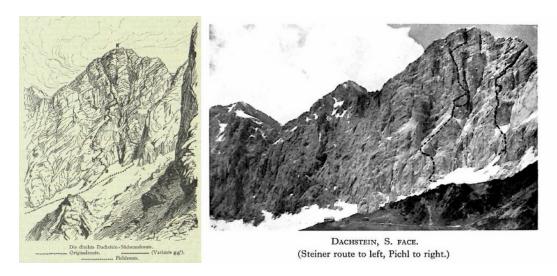
Nel centro la Zsigmondyspitze (Alpi della Zillertal), con la parete N.-E. superata da H. Fiechtl nel 1910. (Fotografia Willi Mayr).

Zillerthal.

ZSIGMONDYSPITZE, formerly called Feld Kopf. (3085 m.= 10,119 ft.). By the E.N.E. Arête from the Floite. In 'A.J.' xxv. p. 664, the direct ascent of this mountain from the Floite, a much discussed problem, was recorded.

The same party, viz. the guide Hans Fiechtl and the guidecandidate Hans Hotter (spelt Kotter in the previous account) have now opened another route from the Floite. The slabby ridge is followed to the foot of the first slabby precipice. An upward traverse to the right leads to a grass-covered projection. Then a 100 m. well-marked narrow crack. Then on the right flank of the arête, very difficult, to a projection on the arête covered with loose stones. Stoneman built. Follow the ridge to the next great step. Then traverse upward to the left and follow exposed and difficult grass ledge to good stand. From here, 30 m., extremely difficult and exposed traverse close under the overhang to the left up to a gap. Then to the left up very smooth wall (fixed 3 pitons) and finally rejoin last year's route on the arête. Follow this till close under the summit tower, then bear to left and gain the summit by a very difficult crack which seams the final tower. Time from foot of rocks, 41 hrs. The climb is described as one of the finest as well as most difficult in Fiechtl's experience. (Cf. 'Mittheilungen,' 1912, p. 85.)

Zsigmondyspitze was one of the first big rock climbs in the Alps. Emil Zsigmondy and his brother Otto first climbed it in 1879, ten years before Winkler's solo ascent of the Vajolet Towers. Originally known as the Feldkopf, it was renamed after Zsigmondy died on the south wall of the Meije in 1885. Right: Although there were many routes where a piton was used for aid to overcome a move or two, Fiechtl's route on the Zsigmondyspitze in 1911 was one of the first alpine rock climbs involving a continuous section of aid (1931 photo and 1912 AJ report).



The south wall of the Dachstein, was first climbed in 1901 by Eduard Pichl (who also first climbed the traverse of all three Vajolet Towers in 1899). The Dachstein was one of the very early routes in the Northern Limestone Alps in which climbers systematically used pitons to create safe belays. (DuÖAV 1911, and AJ, 1937).

Kain's Dachstein record

On the south wall of the Dachstein²² in 1905, which Kain climbed with his friend "R." (a "keen scrambler from the Rax"), they were an efficient team and climbed the El Capitan size wall (~1000m) in 3.5 hours, almost certainly a record at the time. A month later he led the same route with a client (Mr. St.) in 10 hours. Only a small percentage of alpine guides were at this level of guiding involving endurance, quick thinking, and careful route-finding and anchoring skills on these big walls of rock.

"All-Alone" Guiding

In the 1904 and 1905 fall seasons, Kain was gaining experience on the long steep routes of the Dolomites and the Tyrol, multi-pitch climbs with secure anchors for belays. Kain started guiding in an era when two guides per team were considered a minimum for challenging climbs, but Kain was often guiding two patrons by himself even on the steepest and most complex routes. Talented guides like Tita Piaz were further developing

a single guide technique on mostly vertical multi-pitch routes, with the ability to secure clients at belays, eliminating the need for a second guide to safeguard clients. It took another two decades for these techniques to begin to filter to the rest of the world as the optimal team system.

On his first trip to the Dolomites, he guided Sara and Erich Pistor (Dr. P) up the Gross Fermeda Tower, first climbed in 1887 involving steep slabs, overhangs, and an icy ridge to finish. Kain writes, "That evening a fight occurred between myself and a guide from Taufers. He said to me: "'What, you are going all alone with both these people on the Gross Fermeda? Even the best local quides don't do such a thing. Then everyone crowded me and threatened me with blows. In spite of it I could not be guieted for a while, and the guarrel lasted for some time." He admits later that he took some risks on the snowy ridge, but had no issues keeping his team moving quickly and safely on the vertical walls.

²² Footnote: In 1936, the British alpinist L.S. Amery wrote after climbing the south wall of Dachstein with a partner in nine hours and placing a few pitons, wrote, "My experiences of these limestone climbs in the last few years have, I may say, entirely converted me to the view that, used in moderation, the piton or ring-topped peg driven into a crack in the rock and the Karabiner or snap-ring by which the rope is attached to it, are perfectly legitimate mountaineering devices, adding greatly to safety as well as calling for their own technique." Climbers in the British Empire were about thirty years behind the climbers in the Eastern Alps to accept their legitimacy.



Schroffenegger, Piaz, and Wenter: friends and contemporaries of Conrad Kain who were also climbing and guiding the most difficult rock climbs in the first decade of the 20th century (though not clear if Kain knew Käthe Bröske). In a later story he told around the campfire, while posing as a "gentleman greenhorn" and fooling Alp guides from other areas, it was said that the Rosengarten guides, "Those fellows must be like monkeys!". Kain was in fact one of the acrobatic Eastern Alp climbers he often referenced in third person when telling stories.

Rock Climbing with Franz Schroffenegger

After Kain and the Tiers guide Franz Schroffenegger met on Grasleiten Tower, they guided clients together on the Vajolet Towers, where Kain learned new singleguide belay techniques from Schroffenegger. On the Torre Delago, which at the time Kain considered "a tour on the border of human" possibilities," Franz taught him the "mealsack technic," the advancing art of organizing "security" (a belay), then holding, raising, and lowering a client on hard steep routes. Kain writes: "Once I read in the paper: 'Meal-sack technic on the Delago Tower.' A man described how he had been handled in this fashion. He was an honest fellow to tell everything truly which most Delago climbers hide."²³.

²³ footnote: Clients were generally lowered from the rock towers, then the guide descended using a doubled rope using the around-the-leg & foot-brake abseil technique. Franz Schroffenegger from Tiers, one of Tita Piaz's partners on the <u>west wall of Totenkirchl</u>, was one of a handful of guides doing the hardest steep rock climbs, often first establishing pre-placed anchors at belays. In his book, Kain refers to Schroffenegger as Hans and Johann. Later, Kain guided many of the hardest routes on the Vajolet Towers and other testpiece Dolomite towers.

Equipment

Kain did his early rock climbing in wool socks rather than his heavy mountain boots, but soon acquired a pair of the new tight-fitting 'Kletterschuhe' for his rock climbing. The canvas climbing shoes with braided hemp rope soles were starting to be popular in the Eastern Alps and considered essential for real rock climbing. On the Grépon in 1905, Kain writes of pulling a Chamonix

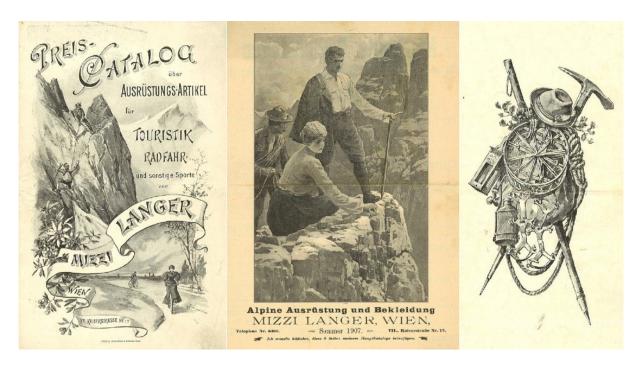
guide struggling up the Mummery Crack: "He had nailed boots, for the Chamonix guides do not understand Kletterschuhe and are not willing to try them. 'He kept calling: Hold tight! Hold tight!'" On trips to new areas, hiring a second, local guide was considered obligatory, but Kain found it much easier on hard rock climbs to guide on his own, especially if he had to employ the mealsack technic for the mountain guide²⁴.



Three key items for Eastern Alps rock climbing in 1910—climbing shoes ("Low climbing shoes, made of strong brown canvas sailcloth with a well-made manilla hemp sole"), marking paper (small pads of bright paper used to mark one's ascent in case of retreat), and lanterns (handheld candle lantern for night approaches and descents).

24

²⁴ footnote: Word quickly got out on Kain's ability to seamlessly guide steep routes, and other clients, many good rock climbers, sought to hire Kain to lead routes as their only guide; he climbed the Grépon three times while in Chamonix, for example. The French guides threatened, but the respected Swiss guides stood up for him (he was remembered for having "fled from a volley of stones in the streets of Chamonix"). Kain also mentions the Chamonix guide's "new spikes (which the Swiss guides have instead of climbing irons)" ←for ice tool historians (1907).



Mizzi Langer catalogs from Vienna; Kain bought his first ice axe from Mizzi.



Traditional L-shaped Mauerhaken with a specific folded design were known as Mizzi Langer pitons and sold in her shop in Vienna. (image: 1922 Neiberl). Many climbers made their own thin pitons at this time, probably thin blades of steel with a hole for a rope sling; Kain, with no blacksmithing skills, was most likely procuring pitons from Mizzi Langer in Vienna, which were probably the L-shaped "wall hooks" also popular at the time. Franz Kauba (husband and co-owner of the Mizzi Langer's shop) organized the client for Kain's Corsica expedition, where they met and bought other equipment for the trip, including ice axes. See the piton chapters and Mizzi Langer pages in Volume 1 of this series.



The five monks in Google Earth. Corsica, France.

Kain and Pitons

Kain only mentions Mauerhaken (pitons) a handful of times in his writing, but it is clear he was both using fixed pitons and placing new ones on many of his climbs. On some first ascents on the granite cliffs of Corsica in 1906, he was equipped with a hammer and pitons: he took the time to show-and perhaps practice—the techniques to some locals: "I showed the herdsmen how to climb on the big granite block (our house), put in a Mauerhaken and roped down. They had never seen anything like that!" Kain writes. Then Kain and Mr. G, "a good rockclimber", climbed the center peak of the Cinque Frati (Five Monks), then traversed to the two highest towers involving exposed overhangs and rappels²⁵. Von Albert Gerngross (Mr. G.) writes in the Austrian Touristen-Zeitung (a bi-weekly newspaper),

"We climb the Cinque Frati (2003 m), those five sharp jagged rocks that rise from the Virotal have never been climbed, and we want to climb. We have provided ourselves with Mauerhaken and rope slings and expect a tough tour from this last day in the beautiful Niolo."²⁶



The Cinque Frati (Five Monks)







Cinque Frati (Five Monks) in Corsica. Konrad Kain did the first ascent of the middle monk with Albert Gerngross in 1906, then traversed to the two highest summits. The two highest peaks were previously ascended by Felix von Cube and Leonardus Kleintjes in 1899. Alf Bryn and the Finch brothers made the first south to north traverse of all five "monks" in 1909.

²⁵ Footnote: Kain and his client Albert Gerngross climbed over eight peaks in Corsica, primarily rock climbs, and at least three first ascents. The French journal La Montagne (June 1911) also reports Kain and Gerngross's first ascent of the northeast wall of Punta di Castelluccia, with its "superb vertical wall" (the author, André Lejosne, tried but failed on the route in 1910). The others are listed in the appendix below. Photos:1909 Alpine Journal, Austrian Tourist News (Vienna, Oct 16, 1909). Thanks to Stephane Pennequin for the third photo and further details on Corsica climbing.

²⁶ Quote from Kain letter to the Maleks; the climb of the Cinque Frati is also included in the history of mountaineering of Corsica is La Corse des Premiers Alpinistes 1852-1972 by Irmtraud Hubatschek and Joël Jenin (2021).

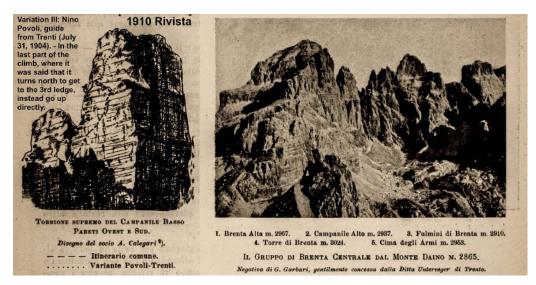
Official Guide, 1906

Kain had gained his official guiding license from the German-Austrian Alpine Club in 1906, which he had applied for in his first year, but by this time he realized he did not need the official recognition to gain clientele, and usually left his Führerbuch (leader logbook) at home; he writes, "I did not like to show that I was a guide." He was fully booked by word of mouth. In between his big mountain tours, he was arranging backto-back clients for long rock routes in the Wilder Kaiser, Ennstahl Alps, Sella Towers, Dachstein, and other rock climbing areas. And he often climbed harder routes solo. On his way home after a month of guiding high peaks in Switzerland and France in 1906, he stopped by way of the Ennstal and set about rope-soloing a new route on the north wall of the Planspitze, a "Kain route", he writes. But after reflecting "going alone over such smooth walls is too dangerous, and I had no Mauerhaken", he retreated.

Zermatt, he climbed the Campanile Basso with Dr. L., and like many on this 300m testpiece tower, he found his way on the complex route by following the fixed pitons along the route (theirs was the 42nd ascent). as well as marking papers left by others. At the Garbari Pulpit, a large ledge high up on the route and only a half pitch from the summit, he saw "two iron spikes and a new rope-off ring. Without doubting I was on the proper route I stormed upwards to the overhang. That stopped me! I tried three times. Impossible. Dr. L became impatient as he was getting cold. I told him to rope (me) down, and I anchored myself." After Kain consulted the guidebook, he followed the original route, the famous bold and blind traverse around to the steep north wall where there were more fixed pitons (including one generally used for upward progress), and writes, "to this day I have never done another bit so exposed".27

Campanile Basso/ Guglia di Brenta (1907)

By his third year, Kain's guiding seasons were long and full, and he was traveling throughout the Alps working and climbing. After another summer season in Chamonix and



The variation Kain backed off from on the top part of Guglia di Brenta/ Campanile Basso. Kain also climbed Brenta Alta and the Torre di Brenta. (1910 and 1908 Rivista Mensile, Club Alpino Italiano)

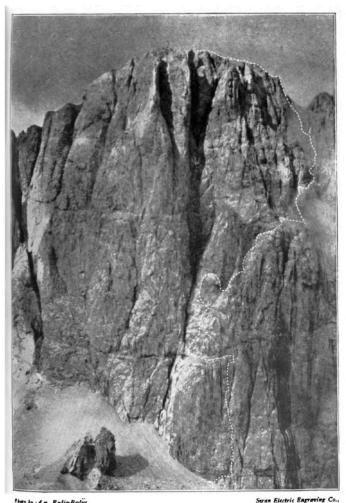
²⁷ footnote: Little did Kain know, but several years before the guide Nino Povoli from Trenti had climbed the difficult direct variation, finally redeeming himself after having failed on the first ascent attempt of Campanile Basso in 1897, when he was ordered by his client Garbari to climb the headwall without pitons, but refused (see also Campanile Basso di Brenta chapter).

Later Kain was to reflect on the "following climbs as ideal: the Vajolet Towers, the east face of Rosengarten, the Fünffingerspitze by the Schmittkamin, the south face of Marmolata, and the north wall of the Kleine Zinne. I was so infatuated with the Guglia di Brenta that I went many miles out of my way to climb this majestic pinnacle. In the (first) three seasons I spent in the Rockies I had not made a single climb, and did not expect to make one, that could be compared with any of these" (1909-1911). Perhaps like phonically related Citizen Kane, Kain's "rosebud" was the Guglia di Brenta, probably the longest continuously steep rock climbing route of his career. In one of the many times Kain felt deep Heimweh (homesickness) for his homeland when living in Canada, in a 1929 letter home he wrote, "As you expect to go to the Tyrol I will ask you a favour. If you see a picture of Guglia di Brenta, please buy one for me, put it in your suitcase and send it when you get home. Bon Voyage."

Marmolada (1908)

Kain climbed the 19th ascent of the 600m south wall of Marmolada with Piaz and two clients in 1908. First climbed in 1901 by Beatrice Tomasson and her guides (see Early Piton Evolution 1a), in 1908 the route was still a renowned rock climbing testpiece. Kain only writes a brief, one-page recount of the climb in his diaries, acknowledging accepting a toprope from Piaz on an overhanging block pitch, but in a letter home to the Maleks, he credits the saving of Piaz's life: "This has been my most difficult tour. Then came another critical moment: the guide, Piaz, and his

gentleman started sliding and fell. And we were on one rope! Fortunately, I had a good hold with very good security."²⁸ The term "security" in those days meant a secure anchor—a tied-off strong horn of rock, or pitons and rope slings. They climbed the wall in 4.5 hours; "We climbed too quickly. It gave me no pleasure," Kain writes, "I can only recommend this expedition to those who have already done the most strenuous things in the Dolomites."



MIDUOLITI S

MARMOLATA SÜDWAND

²⁸ footnote: Kain had a few other close calls. Once, he fell when a grassy ledge collapsed on the Vienna Alpine Club route, Dr. P had a tree for security and belay and caught the fall. In letters, Nov 10 1908 rockfall on Stadelwandgrat. There's more I will try to add later (rock fall Barre des Écrins in Dauphiné and Meije, also Canada & NZ avalanches provide some insight on Kain's instincts, judgment and quick thinking).



Kain credits over 1000 major climbs in his life, and in Europe was well known for his ability to guide the hardest rock routes. Left: probably the route Kain guided on the Totenkirchl. Right:

Kain on the Bischofsmütze, a technical rock climb.



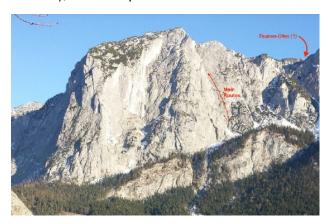
Trisselwand with Elisabeth Benedikt (1908)

In the Totes Gebirge, the most northern of the Northern Limestone Alps, a beautiful 500m wall of stone rises above the dark blue Altausseer See. The southwest wall of the Trisselwand, situated in a more remote part of the alps, was relatively late among the prominent limestone faces to be first ascended by its easiest route. There were many legends about an inaccessible cave high up on its cliffs, known by geologists as a "Halb-höhle" a karst half-cave that soon ends in collapse but looks from below as if it was a deep passage into the depths of the mountain. Some stories tell of "wild women" living in the cave; others say it is the home of the Krampus, the horned half-demon that torments misbehaving children in winter seasons. Kain references the cave as the Tauben-Ofen (Pigeon Oven).29

In Alt-Aussee (now Altaussee) lived Elisabeth Benedikt with her sister Karin. Kain first guided Elisabeth in 1905 on the Planspitze, then traveled and met her in Alt-Aussee. Kain writes of Elisabeth, whom he refers to as "Miss B.": "For several years she had planned a first ascent of the Tauben-Ofen but had never found anyone in Aussee who would go with her." Kain asked the local authorized guide, who bragged he was "the best of mountain climbers," but when

Kain asked about a direct route up the Trisselwand by way of the hole, the guide got angry and said, "None of us have climbed up there, and you arrive for the first time, understand nothing about it and want to go up? You will roll down right down into the pebbles." Kain could see the route would not be difficult, and the next day he soloed up and explored the cave, and could see how the route would easily continue. Kain promised to return to climb the route with Elisabeth³⁰.

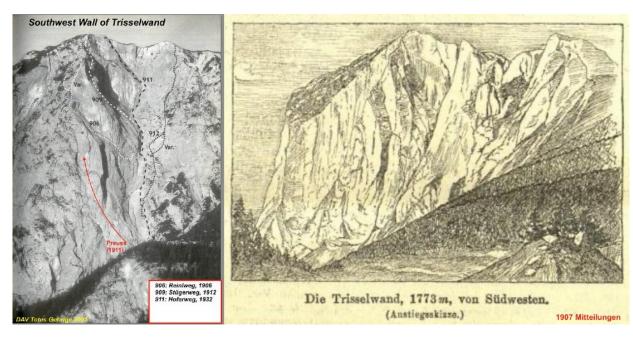
Over the next three years, Kain climbed with Elisabeth, and occasionally with her sister, on successively more challenging climbs, first in his home area the Rax (April 1906), then the Pichl route on the Planspitze (Oct 1906), an attempt on the Bischofsmütze



Trisselwand. The Preuss route goes up the center buttress left of main routes (Reinl, etc).

²⁹ Footnote: Altaussee is the birthplace of Paul Preuss, born in August 1886 at his family's summer home, and where he later found the strength to recover from polio in his first decade of life, gradually increasing his range of walking around the lake. These days it is a pram-friendly three-hour hike to circumnavigate the lake. Both Preuss's and Kain's fathers had died before they were ten years old, and Preuss's trip to the Gesäuse to first climb the Austrian testpieces there were only a few years after Kain's (who was three years older). Through the sisters Elly and Karin Benedikt, who lived in Altaussee, Kain and Preuss might have known each other, but certainly would have known of each other, one from a working-class background, and the other from a well-off family. See also Paul Preuss, Lord of the Abyss, by David Smart.

³⁰ That same month (June 1905), Hans Reinl had the same idea, and also made some exploratory climbs. The next year on May 13 1906, Reinl with Karl Greenitz and Franz Kleinhans returned to climb the first ascent of the SW wall creating a classic "Reinlweg". Kain apparently returned to the Trisselwand at the end of June, 1906 to investigate climbing it by way of Trisselwand Pass, which he said, "the people there did not believe it could be ascended from that side". It appears Kain was on the hunt for a new route on the Trisselwand to do with Miss B.



It is not entirely clear which route Konrad and Elisabeth climbed on the Trisselwand four days after Preuss soloed it, but possibly a variation of the Reinlweg (#906 in left photo). In the Styrian Alpen-Post, Preuss reports that by the end of 1911, the southeast wall of the Trisselwand wall had been climbed over 30 times including seven women and two solo climbers.

(Nov 1906, too snowy), climbs in the Ennstal and cumulating with an exciting climb of the south wall of the Dachstein (Sept 1907), complete with rockfall—"an avalanche of stone, which for a short time placed us in the utmost danger"—and a swinging fall on the crux of the route—"she swung out nearly a meter and a half, and lost her hat," Not to be outdone, Elisabeth's sister Karin sent Kain a telegram to stand by for the same climb. During their ascent, Kain complains of her equipment (her four pairs of boots!) but mentions, "she was a very good climber, only self-centered and of different character than her sister. The lady made the difficult traverse very easily, and I must admit that she never put her whole weight on the rope."31

Finally, in September 1908, Kain met Elisabeth in Altaussee for their long-planned climb of the Trisselwand. They were aware of the 1906 Reinlweg, which by that time had a reputation and been repeated several times. Theirs might have been a separate line, as Kain notes, "the native guides were aware of the lady's project, they came to me and said we were both fools; it was impossible to surmount such a rock wall. I told them it had already been done by the engineer Reinl. 'It has not!', they all shouted together."

It turns out they followed a route climbed by Paul Preuss alone, only days earlier, who had left Mizzi Langer Markierungsblätter (marking papers), showing the way. Kain also found a fixed rope in a chimney which

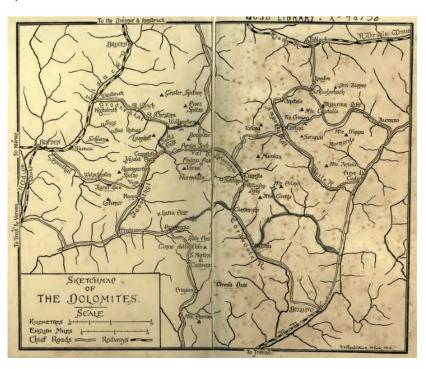
³¹ Footnote: Kain mentions planning to be in Aussee on June 30, 1906, but there is no record of his time there. In September 1907, he met Elisabeth in Aussee and they traveled together to Gstatterboden for routes in the Ennstal Alps. In the Hotel Gesäusse, Kain met three women "two girls with their mother", whom he had guided up the Hochtor in 1906, with whom he was on friendly terms. Kain implies both jealousy and teasing from Miss B. on that occasion. He also mentions climbing the "Grat" (probably Stadelwandgrat in Rax) with Miss Benedikt in his letters to Amelie Malek.

he "rolled up and tossed down". A young girl from Alt-Aussee had hiked to the summit, "curious to see whether a woman could really ascend the Trisselwand." Kain writes, "If we had not had the boy at the start and the girl at the finish of the climb as witnesses, no one in Alt-Aussee would have believed we had done it."

On September 26, the Steierische (Styrian) Alpen-Post reported the "daring tourist Miss Elisabeth Benedikt from Vienna," who had dreamed of the climb as a child, climbed the

1000m high (sic) wall in less than five hours with Konrad Kain from Nasswald "without the slightest accident." But Elisabeth took offense to the published praise, and downplayed her accomplishment as "second in rope." In a response letter to the Alpen-Post, she writes, "Four days before our ascent, the Durchkletterung (route) was solo climbed in dubious weather and wet rock, namely from Mr. Paul Preuss from Vienna, who has spent the summer months in Altaufsee since his earliest childhood. We also owe our ascent to his marking of the whole route with red paper strips."32

Elisabeth was known to be a painter, but very little else is known about her. As rock climbing the steep walls of the Alps developed, more women were entering the sport and soon climbing at top levels, and like many of the men even Preuss, they sometimes climbed with guides to advance their craft³³. Like the ten-year "missing history" of Beatrice Tomasson (1901-1911), very little information survives about the women who were big wall climbing in the first decades of the twentieth century.



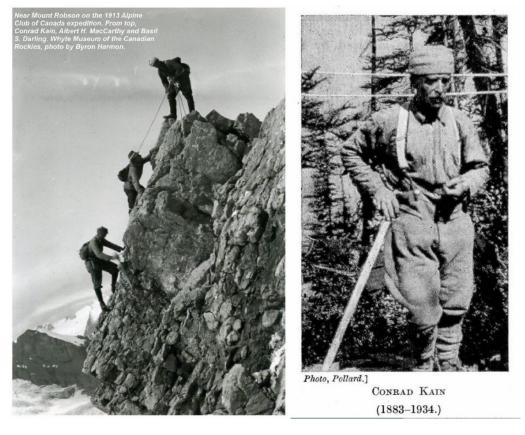
1910 Guide to the Dolomites map, SH Hamer.

³² footnote: On October 4, 1911, Preuss climbed the direct west pillar of the Trisselwand with Dr. Gete Loew from Vienna, and the guide Hans Hüdl from Aussee in 8.5 hours. In the December 2, 1911 Alpen-Post, Preuss admits to reluctantly placing two pitons on a tricky and risky traverse, the only pitons he placed in his short but brilliant mostly onsight-solo climbing career (though in his early career, he did sometimes use fixed pitons on rope solo ascents). In 1911 Preuss took the two sisters Elly (Elisabeth) and Karin Benedikt up the Reinlweg separately on the same day. The 1914 Mitteilungen also reports a new route on the West Pillar by Minna Preuss and Rudolf Redlich on July 24, 1912.

³³ footnote: Kain and Elisabeth did one more route: the Jahn-Zimmer on the north wall of the Hochtor, which was put up in 1906 and became the more classical route up the north wall of the Hochtor, with 28 pitches of continuous technical rock climbing (see "topo" above). It would have still been a fearsome route in 1908, and Kain reports, "At the difficult traverse I fastened the lady to the Mauerhaken." He wrote of Miss B., "I was astonished at the endurance of the lady."



Mt. Robson trip report in the Austrian news, with route marked. First ascent on July 29, 1913, by Conrad Kain, Albert MacCarthy and William Foster. On the summit during the first ascent, Conrad Kain famously told his team, "Gentlemen, that's as far as I can take you." (Thorington, 1935).



After many years of international guiding, Conrad Kain moved to Cranbrook, BC Canada, where he died in 1934 (b.1883).

APPENDIX

PEAKS ASCENDED BY CONRAD KAIN

"Indispensable, ever-victorious Conrad Kain, whose record of new ascents must be one of the longest and most remarkable held by any guide now living."

—A. L. MUMM in the Alpine Journal for 1917.

ALPS

Maritime Alps: Punta dell' Argentera.

Cottian Alps: Monte Viso (4th ascent by W. ridge; traverse); Viso di Vallante.

Dauphiné Alps: Barre des Ecrins (traverse from S. W.; twice); Mont Pelvoux, Meije (traverse; twice); Grande Ruine, Aig. d'Arve Mèridionale, Col du Sélé.

Pennine Alps: Mont Blanc (Bosses route; also once as far as Vallot Hut; also from Tête Rousse and down to Grands Mulets); Dôme du Gôuter, Aig. de Blaitière, Aig. des Grands Charmoz, Aig. du Géant. Aig. de Grépon (three times); Weisshorn, Zinal Rothhorn (traverse); Trifthorn (traverse); Matterhorn (twice); Lyskamm, Breithorn, Riffelhorn (N. route); Monte Rosa (Dufourspitze, twice; Signalkuppe, twice; Parrotspitze, twice; Balmenhorn, Grenzgipfel, Zumsteinspitze, Ludwigshöhe); Südlenzspitze, Nadelhorn, Dom, Weissmies, Portiengrat.

Silvretta Alps: Fluchthorn, Piz Buin, Gr. Litzner.

Salzburg Alps:

Kaisergebirge: Totensessel, Totenkirchl (twice, including S. ridge); Predigtstuhl (twice, including Botzong Chimney).

Ennsthaler District: Planspitze (all sides, including several routes on N. face); Hochthor (numerous routes, including N. face); Hochthor-Oedstein; Oedstein (several routes); Reichenstein (various routes); Gr. and Kl. Buchstein, Festkogel (N. wall); Tamischbach Tower.

Dachstein District: Gr. and Kl. Dirndl, Thorstein (all sides); Eiskarlspitze, Gr. and Kl. Bischofsmütze, Dachstein (various routes, including S. wall); Trisselwand (Todtes Gebirge).

Rax and Schneeberg District: All important routes, some of them original.

Ortler Alps: Cevedale, Schrötterhorn, Königsspitze, Ortler.
Central Tyrolese Alps: Schwarzenstein, Zsigmondyspitze, Gr. Greiner,
Mösele.

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Lombard Alps: Brenta Alta, Torre di Brenta, Guglia di Brenta.

Dolomites of South Tyrol: Fermeda Tower, Fünffingerspitze (including Schmitt Chimney); Grasleiten Tower, Grasleitenspitze, Third Sella Tower, Vajolet Towers (many times, including two traverses from Winkler to Delago, and the latter twice by the Pichlriss; also, Stabeler, Winkler, Delago and the three northern towers in one day); Sasso di Stria (Witzenmann route); Tofano di Mezzo (Via Inglese); Marmolata (S. wall); Wundtspitze, Einser, Gr. Zinne, Kl. Zinne (E. wall).

Julian Alps: Manhart, Monte Canin, Wischberg.

Corsica: Monte Cinto, Punta Castelluccia (new route), Capo Tafonato (first ascent); Paglia Orba, Capo Uccello, Punta Minuta, Cinque Frati (four summits climbed, one of them a first ascent), Monte d'Oro.

Conrad Kain's routes in the Alps, compiled by Thorington (1935). Quite a resume before he launched his guiding career in North America.

Off to Canada (1909)

Even though Kain worked every day possible throughout the season, he ended the year with little savings. He writes, "Now the year 1908 is over. What is the result? The summer season was not much, the earning even less. I was just the same as in the year preceding healthy, contented, but with nothing in my pockets! What would the year 1909 bring forth?" With the help of Dr. Pistor, Konrad Kain procured a spot on the 1909 Alpine Club of Canada summer expedition to the Rockies, and amidst some skiing and climbing, earned and borrowed enough (150 Kronen) for the trip over. On May 29, 1909, he left Vienna with a large traveling bag, chest, rucksack, and two ice axes.

From 1909 to the 1930s. Kain climbed with members of Alpine Club (UK), Canadian Alpine Club, New Zealand Alpine Club, American Alpine Club, and the Appalachian Mountain Club. exposing to the English-speaking mountaineering world the new techniques of safely climbing multi-pitch rock routes primarily with one "all-alone" guide. He created strong partnerships with his clients that enabled new standards of difficulty to be overcome in the mountains. By all accounts, Kain was a great storyteller and a talented guide who worked harder than thought humanly possible, always maintaining a positive attitude no matter what the conditions. He once wrote that he enjoyed trapping in the Altai Mountains in Siberia more than mountain guiding, but nothing could be compared to the twelve-hour days smashing rocks underground of his prior life. Just months before he first left for Canada, he wrote in his beginning English, "I do no more want a work in the stone breaking." And indeed, he never had to.

Europe in 1914, and the epicentre of hard piton protected free climbing, the Tyrol, part of the Austrian-Hungarian Empire. Techniques developed here spread throughout the world in the 1930s.

WHERE THE CLOUDS CAN GO

although the Whirlpool River was in flood. There were banks of snow about the little lakes on the pass, and a caribou went slowly up the slopes as we arrived.

Mt. Kane was traversed, and Mt. Brown ascended, but our principal objective, Mt. Hooker, was not to be reached from this side. We returned down the valley and made camp below the superb Scott Clacier.

Penetrating to the upper basin, not without some strenuous icework on Conrad's part, we ascended Mt. Oates. This was followed, two days later, by a successful attack on Mt. Hooker, a miniature Mt. Cook, during which we came into some danger through falling stones.

It was the beginning of a raking fire in which we were all struck, but luckily without damage. Conrad, calmly saying 'Gentlemen, we must move a little to one side,' relieved the tension; we quickly got out of range, in time to avoid a heavy bombardment of larger boulders that came banging down over our intended path and would surely have done for us had we persisted. We realized afterward that in Conrad's cool leadership, in emergency, we had seen one of the finest things produced by mountaineering art.

Coming late to the summit we were obliged to bivouac and, on account of fog and snow which followed, were compelled to spend two nights in the open, high on the mountain. That we did not get into more serious difficulties was entirely due to Conrad. One never heard him utter a word of complaint.

Right: excerpt from Conrad Kain's biography, describing a moment of intuition on a climb with Max Strumia, a very similar experience I had with Xaver Bongard, who was also a trained and experienced mountain guide, on Great Trango, when he warned me to get out of an avalanche gulley moments before an avalanche crashed down.

CANADA

(Based on a list written by Kain himself. As the manuscript is in pencil, it is now difficult to decipher and some peaks cannot be identified with certainty. Many of the summits were attained more than once, and some, not so indicated, may have been first ascents.)

ROCKIES

(International Boundary to Kicking Horse Pass.)

Pk. N. of Crowsnest (? Pt. 8500 ft.), Pk. between [blank] Creek and Oldman River, Windsor (Middle Kootenay Pass), Pk. S. E. of Windsor, Pk. S. of S. Kananaskis Pass, Pk. N. of S. Kananaskis Pass, Douglas (camera sta.), Fatigue, Nasswald (first ascent), Bourgeau, Pk. at head of Brewster Creek (? Brewster Cr. W.), Monarch (first ascent), Cautley, Wonder (first ascent), Terrapin (first ascent), Magog, Assiniboine, Wedgwood, Eon (second ascent), Pk. E. of Indian Pk., Storm, Storm S., Mitchell, Whymper, Boom, Toork (sic—cannot identify; ? Tokumm), Bident, Fay, Little, Pk. next Fay (? Quadra), Hungabee, Eiffel, Temple, Victoria, Victoria N., Huber, Lefroy, Aberdeen, Haddo, Collier, Popes Pk., Niblock, Whyte, Odaray, Mitre, Stephen, Rundle.

(Kicking Horse Pass to Yellowhead Pass.)

Cascade, Louis (first and two additional ascents), Edith, Pk. N. of Edith, Oyster, Richardson, Unnamed near Richardson, Bosworth, Niles, Balfour, Unnamed between Hector and Bow Lakes, Gordon, Collie, Des Poilus (Habel), McArthur, Kerr, Pollinger, Marpole, President, Vice-President, Yoho, Baker (second ascent), Peyto (first ascent), Mistaya (first ascent), Trapper (first ascent), Barbette (first ascent), Survey Pt. opposite Mt. Bryce (Bryce S.), Watchman, Pk. E. of Bryce (Bryce N. E.), Pk. between Alexandra and Whiterose Creeks (Lyell Cr. No. 2), Cathsertls (sic-? Castelets), Wilcox, Nigel, Shale (sic-cannot identify), Sunwapta, Athabaska, Athabaska S., Terrace (first ascent), Saskatchewan (first ascent), Castleguard (first ascent), Columbia (second ascent), King Edward (first ascent), North Twin (first ascent), two Pks. N. W. of Alberta (? Pts. 9600 ft. and 9200 ft.; possibly S. E .- 'Little Alberta'), Warwick (first ascent), Pk. N. of Sundial (? Pt. 9200 ft.), Sundial (first ascent), Chaba W., three Pks. E. of Fortress Lake, including Chisel (first ascent), two Pks. W. of Fortress Lake (Survey—cannot identify), Oates (first ascent), Hooker (first ascent), Kain (first ascent), Brown, Simon (first ascent), McDonell, four Pks. from Jasper to Maligne Lake over Shovel Pass.

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(Yellowhead Pass and Northward.)

Pyramid (Jasper; first ascent), Mowat, Pk. on Moose River (Resplendent S.), Reef Glacier Pk., Colonel (first ascent), Upright (first ascent), Pk. at head of Stone Creek (Stony River Head Sta.), Calumet (first ascent), Moose Head (Moose Pass Sta.), Titkana, Lynx, Resplendent (first and subsequent ascents), Robson (first and subsequent ascents), Gendarme (first ascent), Mumm, Pk. E. of Longstaff (Whitehorn E.), Whitehorn (first and subsequent ascents), Grizzly (two Pks.—Robson W.), Robson S., Red Pass Pk.

SELKIRKS:

Afton, Sir Donald (alone), Uto, Avalanche (alone).

PURCELLS:

Bobbie Burns ('Mt. Conrad'; first ascent); Pk. on Bugaboo above cabin (Bugaboo Forks), Howser Spire (first ascent), Howser Pk (first ascent), 'False Howser' (two summits on E. arête of Howser Pk.), Pk. to right (N.) of Bugaboo Pass, Pk. to left (S.) of Bugaboo Pass (Quintet Group), two Pks. on range W. of Howser Spire, Pk. on range between Howser and Bugaboo Creeks (Septet Group) cannot identify), Marmolata (first ascent), Pigeon (second ascent), Crescent (first ascent), Pk. N. of Ethelbert (first ascent), Ethelbert (first ascent), Pk. S. of Ethelbert ('Horeb'; first ascent), Star-bird (first ascent), Sally Serena, Pk. W. of Sally Serena, Birthday (first ascent), Eyebrow, Monica (first ascent), Dome (Horsethiel), Jumbo (first and subsequent ascents; once alone in winter), Karnal (first ascent), Commander (first and subsequent ascents), Black Diamond (first ascent), Peacock (first ascent), Spearhead (first ascent), Delphine, Farnham (first ascent), Farnham Tower (first ascent), Peter (first ascent), Cleaver (first and subsequent ascents), Redtop (two Pks.; first ascent), Blockhead (three Pks.; first ascent), Truce (first ascent), Cauldron (first ascent), Nelson, Monument (first ascent), Boulder (first ascent), Toby (traverse), three Pks. at head of Toby snowfield (first ascents), Earl Grey (first ascent), Pharaoh (first ascent), Survey Pk. E. of Earl Grey, Findlay (first ascent).

Kain's climbs in Canada.

Altai Mountains (1912)

Some of Conrad Kain's climbs in Canada will be covered in the next section, but also worth mentioning is his 1912 expedition to the Altai. In the Smithsonian archives, the Altai trip is summarised: "The expedition was a joint effort of the United States National Museum and the Museum of Comparative Zoology at Harvard during the summer of 1912, to study sheep, ibex, and other large game in the Altai Mountains of the Russian and Mongolian region of Asia. The collection of small vertebrate animals. including birds, was also an important goal on the expedition. In total, around 350 mammal specimens were collected. The group departed St. Petersburg on June 8th and headed east. In total, the trip lasted four months and continually faced harsh weather conditions throughout the mountains. The long journey to the "scene of operations" resulted in only around thirty-five days of actual collecting. However, during the expedition an important collection of mammals was made, including thirteen new species and subspecies, along with others previously unrepresented in American museums. The expedition's routes followed that of the Demidoff and Swayne's

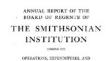


Kain's ship to New Zealand 1912-1913. Kain embarked in November on the Ocean **Liner Orsova Orient Steam Navigation** Company; onboard, he wrote letters almost daily to Amelie. [landing in Melbourne Nov. 22 (letter 68) to Jan 2 1913 Sydney (letter 80) Jan 8 (letter 81) in Wellington, NZ.]



Altai 1912. Kain traveled to the Altai Mountains with Ned Hollister's scientific expedition in 1912. Kain's role was to hunt and trap mammals; he writes, "My work is very interesting. I like it better than mountain guiding. Hollister is one of the best people anywhere." See CAJ 1913, "Camps in the Altai". An interesting spot with four major countries meeting on a mountain ridge.

"sporting" expeditions from 1900-1904. This included embarking Novonikolaevsk aboard a steamer on the Obi River, reaching Bisk, Kosh-Agatch, and the Chuisaya Steppe of Mongolia. Participants in the expedition included Ned Hollister (Assistant Curator, U.S. National Museum), and Dr. Theodore Lyman (Harvard University), Conrad Kain (Hollister's assistant), a Russian interpreter, and four native Tartars and Kalmuks."



1912



SIBERIAN EXPEDITION

Through the liberality of a friend, Mr. Theodore Lyman, of Cambridge, Mass., the Institution has been enabled to participate in a zoological expedition to the Altai Mountain region of the Siberia-Mospolian border, Central Asia, an exceedingly interesting territory, from which the National Museum at present has no collections. A Museum naturalist was detailed to accompany him, the expeases of the expelition being borne by Mr. Lyman, and the natural-history collections obtained to be deposited in the National Museum. Although this expedition had not completed its work at the close of the fiscal year, yel I may here anticipate some of its results by stating that the Museum will probably be enriched by a large number of interesting specimens of birds and mammals.

The scene of the survey and exploration, the Altai Mountain region, is a particularly wild country and quite unsettled, although it is well stocked with game. These memutains are inhabited by the largest of the wild sheep, which, with the lbex, will form the principal big game animals sought by the party, but a general collection of smaller manumals and of birds will also be made.

Smithsonian report of the 1912 Altai Expedition.

AREA OF THE REGION

The Dolomite region, then, forms roughly a sort of rectangle. The northern side of this rectangle is the Pusterthal; on the east the Sextenthal and the valley of the Piave down to Belluno, make a convenient border-line; on the south, one might draw a line across from Feltre to Neumarkt (some way north of Trient); while the river Eisak bounds the district on the west.

It is true that there are Dolomites (in the geological sense) in other parts of the Alps than South Tyrol; there is, for example, the Brenta Group, which lies to the north-west of Trient; dolomite rocks occur, too, in the Dauphiné Alps, and in the Err Group, north of Splügen (the Piz d'Aela, the Tinzenhorn, and the Piz Michel). The Dolomites of Tyrol, however, have appropriated the term to themselves; they cover a much larger area than any of the other dolomite rock-formations found elsewhere, and one may fairly claim that by now the name is generally limited to the district indicated.

The name is derived from Déodat de Gratet,

THE DOLOMITES

Marquis of Dolomieu, who took his title from a village of Grenoble in the Dauphiné Alps. He first visited these mountains in 1789, and it is somewhat singular that, while he examined and described the Tyrolese mountains of this formation, he does not seem to have devoted any attention to the peaks near Grenoble, which are composed of similar rock.

Dolomite is a peculiar form of limestone, consisting of carbonate of lime and carbonate of magnesia, and is generally described as "magnesian limestone."

The district is still much less visited by English tourists than it deserves, and, indeed, it is only in recent years that it has become at all popular among travellers of any nationality. So recently as 1873, Miss Amelia Edwards was able to describe her journeyings in this region as a visit to *Untrodden Peaks and Unfrequented Valleys*; she gave ample reason for the comparative isolation which the region then enjoyed: "the absence of roads; the impossibility of traversing the heart of the

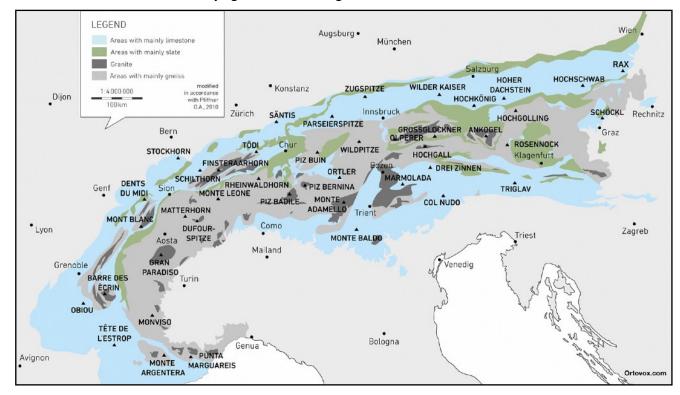
ROADS AND COMMUNICATION

country except on foot or on mule-back; the tedious postal arrangements; the want of telegraphic communication, and the primitive quality of the accommodation provided for travellers."

All this, however, is now changed, and there are those who fear that the Dolomites may speedily share the fate of Switzerland, and be over-run by the "tripper" and the "peak-scalper." Much has been done and is still being done to facilitate transit for the general travelling public; good roads have been made, the railway now runs to points from which the district may readily be reached; telegraphic and even telephonic communication is almost universal, and comfortable accommodation may be met with everywhere.

Happily the district is not yet so overcrowded in the holiday season but that one may still find "unfrequented valleys" where one meets with homely hospitality and courtesy, combined with moderate charges and scrupulous cleanliness. A dress suit is not yet an essential article of one's impedimenta,

pages from a 1910 guide to the Dolomites.



Rock types in the Alps. Courtesy Ortovox.

British Empire Pitons 1920s to 1940s



"Though I am not one of those who believe that sin came into our mountain world when the first piton was planted in the Rock-garden of Eden, I sympathise with the traditionalists who feel that some of the romance has gone out of mountaineering now that the word "inaccessible' has been banished from our vocabulary, and who deplore the fact that any cliff can be climbed by those who have enough pitons and enough time to return every night to the foot of the cliff, and resume their engineering next day until a piton ladder is completed to the summit."—Arnold Lunn, Alpine Journal, 1957

The Commonwealth

The British Empire transitioned to become the Commonwealth of Nations during the 1920s-1940s global era of advancing technical climbing tools and techniques. As was tradition in Britain, most Commonwealth climbers also shunned artificial climbing techniques, even as innovation and technology boomed in other realms. As the last gasps of resistance were published in the 1950s, acceptable use of pitons was finally unleashed, and British climbers became top tier global big wall climbers within a decade. But first let's consider the background.

British Attitudes

Attitudes towards artificial aids including pitons were mostly disdainful by British authors in this period. For example:

"Many of the 'Hammer and Nail Co.' are bad mountaineers. In extreme cases the leader will drive in a spike and call on those below to pull (and) will repeat the process until his stock of ironmongery is exhausted. It would surely be more sensible if these mechanics took a portable windlass, or even a steam winch, and sufficiently long rope...".

—The Details of Rock Work, Peacocke, 1943.

Peacoke admits that "on a holdless face a piton may be thrust into a crack to make a belay", but it was a slippery slope to begin to accept pitons as a protection tool for rock climbs, and local British climbers responded with outrage toward any pitons placed on home crags, such as on the "Munich Climb" in 1936, where a Bavarian team placed three pitons on a difficult route on Tryfan (now rated 5.6). The pitons were quickly removed, the climb done without their need, and another round of climber debate ensued.

Six decades later the route was still used as a reference in Ken Wilson's "Will rock climbing degenerate into theme park exercise?" article in the 1998 Alpine Journal. Nevertheless, as a high standard of unprotected vertical rock climbing began to develop, this is not to say the British climbers did not appreciate the benefit of pitons on routes on the continent, with frequent reports of essential pitons in the early Alpine Journals, especially in the earlier years of piton-protected climbing.

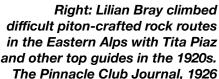
Acceptance of tools affects innovation.

Prior to WW2, pitons were not accepted as a standard climbing tool in the UK, Canada, or New Zealand. Journal reports mostly covered the mountaineering accomplishments, with most excursions recommended for ascent with trained Alpine guides (two preferred). Pitons, carabiners and anchored-belay lead techniques were not essential for safe ascents of these mountains.



Although piton use and practice on the cliffs at home was highly frowned upon, pitons were used and acknowledged by British climbers on routes in the Alps, such as long rock alpine routes like the Piz Badile.

Much could be written about the changing attitudes toward climbing hardware in the UK, but because pitoncraft was not a proper mountaineering topic of discussion, there was limited shared information and ideas about their design and use; therefore the innovation story of the state-of-the-art technical rock climbing equipment—pitons and Karabiners—is muted for many of the Commonwealth nations during the 1920s-1940s period.³⁴





Little Peak.

4. Cleft through ridge.
5. Where we spent the night.

SNEEJNIE TURNIA. THE NIGHT WAS SPENT JUST TO THE RIGHT OF THE PRINCIPAL SUMMIT.

Left: In the High Tatras, Ruth Hale reports placing pitons to secure her team for a bivouac on a small ledge. "That was the coldest night of my life. We all shivered so violently that none of us could sleep.", she writes. "The rocks were so rotten that it was impossible to find a sound belay anywhere, or even a rock firm enough to hold a piton, and it was not worth risking a long and unsecured traverse across such treacherous ground." and "We hammered pitons into the rock and tied ourselves on." (The Pinnacle Club Journal, 1932). One of many inspiring rock climbing stories told by early British climbers in The Pinnacle Club Journals.

34 Footnote: More on the changing attitudes toward hammered hardware will be covered in next chapters. The "clean climbing" gear story will also be covered later, within the evolution of bigwall tools and techniques in the 1950s and beyond. The clean climbing story is well told at Stephane Pennequin's Nutstory Museum (online). Note to add a reference to "small pebbles wedged into cracks" to aid an ascent by Crawford in Zion on the West Temple in 1933 (TK). JW Fraser in 1916 is also reported to have used "innovative use of chockstones and threaded belays as a safeguard" and "scientific use of roping methods for safety on Table Mountain" in South Africa (AJ, 1978).

Bregaglia Group.

PIZ BADILE (3311 m. = 10,863 ft., S. map; 3307 m. Lurani and I. maps). By the N. face (sic), Signori Gaetano Scotti, Angelo and Romano Calegari, July 30-31, August 3, 1911.*

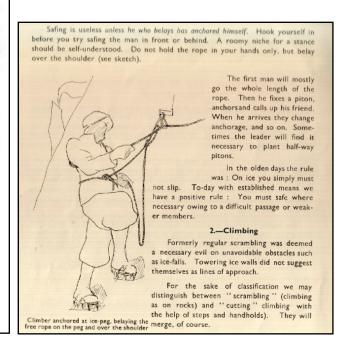
[The N. face of Piz Badile—as seen from Soglio—is really composed of two distinct faces, N.E. and N.W., separated from each other by the N. or Sassfura buttress. The route described below commences on the N.E. or Bondasca face, but soon takes to the buttress, up which, with frequent short digressions to the W. and occasional ones to the E. face, it proceeds to the summit.]

July 29.—Party explored route from a bivouac near the Sassfura huts.

July 30 .- 5.15 A.M. left bivousc; by débris to the small Cengalo glacier, up this quickly to the first rocks of the mountain, where boots, axes, and all superfluous luggage deposited. Kletterschuhe put on (6.30 a.m.). Up the repulsively smooth and at first rotten rocks of the N.E. face between the precipitous N. ice couloir of the Colle del Cengalo and the mountain's immense N. buttress, then W. by tiny ledges ('pitons' fixed) towards a notch in said buttress, attained finally by perilous and delicate gymnastics. Then up the buttress till forced on to its W. slope, whence a disintegrated crevice leads back to the knife-edged crest. Along this till too steep, then a short descent again on W. side over smooth, holdless slabs (pitons). Now up a vertical crack, avoiding conspicuous gully of black ice, till a most difficult slab gives access to narrow gravelly ledge. (Halt 11-11.30 A.M.) Further progress appears hopeless, nevertheless attempt is made; rocks smooth as glass, exposure indescribable, party crawls upwards by minute irregularities. Nowhere can the leader secure himself or his followers. Small gap in crest attained only to be forced back at once on to W. slope, whence (rope and piton) crevice is reached by most difficult traverses. Up this crevice, rather easier, but rotten rocks, to 'little platform.' Next vertical and perfectly smooth step is scaled by a human pyramid, aided by pitons and fixed ropes; exertion and difficulties intense. Following bit overhangs, but is turned immediately

· Courteously communicated by the late Dr. R. Balabio.

Piton technique described in the British Alpine Journal on Piz Badile, 1912, one of the more difficult technical climbs in the Alps at the time, describing the state-of-the-art piton use of the time to overcome smooth slabs and overhangs.



"Safing" was a term sometimes used to refer to pitons used as a belay in Britain. Mountaineering Journal, December, 1932.







1913 Alpine Journal report on an ascent of Mont Aiguille in in the French preAlps: "We were glad to find two pitons in place, but had so underrated the climb to bring only 40 feet of rope, which about 10 feet too short for every pitch where it was needed." After WWI, reports acknowledging piton use became more rare in Britain, as debate about artificial anchors continued.

New Zealand

In New Zealand, with so many still-unclimbed high mountain peaks requiring advanced mountaineering techniques, pitons are hardly mentioned in the journals prior to WW2, and then mostly in reports of climbs in the European Alps, not at home. As was with Alpine Journal articles, New Zealand "stories" about pitoncraft often clumped early bigwall climbers of the Eastern Alps as "Munich Climbers" with their techniques described as awkward methods of ascent (1937).

Any piton use was generally written off as unsporting "rock engineering" (NZAJ, 1934), or as climbing with a "'tool-shop' requiring "ice-pitons, swivel hooks, ice hammer, piton guard and other pegs, pulleys and tackle in various combinations. We are on unfamiliar ground, and long may it continue so." (NZAJ, 1933). So there was not much rock-protection tool development during this time in New Zealand, though guiding techniques and cold-weather high mountain alpine tools and techniques flourished (expedition bigwall equipment will be covered later).

Mount Aspiring. The first ascent in 1912 travelled across the Bonar Glacier and up the NE ridge in the foreground.

Australia



With many crags near regional centers, rock climbing became a popular sport in Australia in the 1930s (left: April 1931, the Blue Mountaineers. Right: August 1936, climbs in the Warrambungles)

Australia

Australia has never had a national mountaineering and climbing club, so records of early climbing are more sparse, but the continent has a long history of technical climbing, perhaps the longest by thousands of years, as there is evidence the Indigenous Australians were using ropes and climbing technical ground for a myriad of cultural reasons. The peaks and hills are the country, but as elsewhere during this period, "conquest" is the term often denoted for the first recorded ascents of peaks and features, along with their Anglo renaming.

in the late 19th century, as mountain climbing, along with its adjunct specialist pastime of rock climbing, were considered sport within the British Empire, British Alpine Journals and instructionals were read by keen mountaineers in Australia. By the time of Federation (1901), most high summits had been ascended in Australia (with few notable exceptions, such as Tasmania's Federation Peak, not climbed until 1947).

Notable early mountaineers include Freda du Faur (1882-1935), who climbed, among other impressive ascents, Aoraki (Mt. Cook, 3670m) in 1910 in six hours with the two New Zealander guides Peter and Alec Graham, highly skilled in the Swiss guiding methods using ropes to safely move as a team of three, with the ice axe as the only tool to laboriously cut steps in the ice fields.

In the "guideless" category, George Finch (1888-1970) was an Australian iconoclast and a leading European Alps climber, who openly dispensed with confining "rules". Unlike many of his contemporaries, he defended the use of artificial means in the mountains, and in his 1924 memoirs describes the benefit of pitons on the west ridge of the Bifertenstock in Switzerland, a futuristic route for the time, climbed with



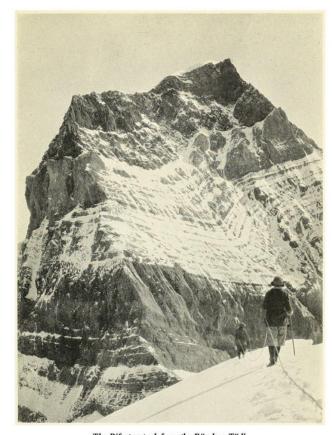


Top: Freda Du Faur. Bottom: 1911 "The Ascent of Woman" (Freda du Faur was left out--perhaps she was not well known in Europe). See Volume 1 for full description.

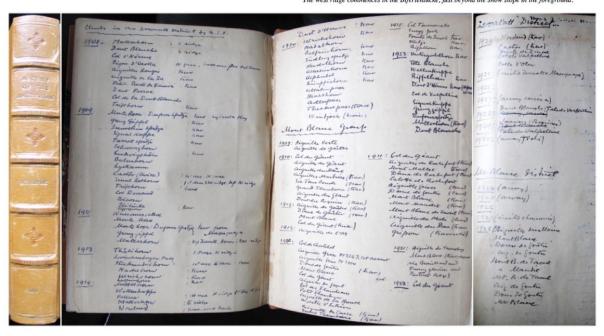
Captain T.G.B. Forster in 1913.35

Finch became well known for his highpoint on Everest during the 1922 British attempt. A chemist by trade, Finch developed new portable oxygen systems for climbing the highest mountains, a time when supplemental oxygen in the mountains was considered 'artificial aid' in the same realm as pitons.

Left: The Australian George Finch climbed the steep west ridge of the Bifertenstock in 1913, using ring-pitons (flat blades of steel with a welded ring at one end), carried in the large coat pockets and hammered in with a rock. Below: Finch's 1920 notes of his climbs in Switzerland in his copy of Whymper's Ascent of the Matterhorn (published 1880).



The Bifertenstock from the Bündner Tödi.
The west ridge commences in the Bifertenlücke, just beyond the snow slope in the foreground.



³⁵ Note: from Finch's <u>The Making of a Mountaineer</u> is possibly where the notion that ring pitons prior to carabiners required the leader to tie and re-tie after threading the rope through the ring of a piton. As information about pitons was limited in the English-speaking world, the use of slings (called rope rings) as often described in the Eastern Alp journals, was possibly unknown (or maybe they just did not have any--he carried the pitons in his pockets, and hammered them in with rocks).

Technical tools eschewed

As elsewhere in this period of industrial expansion, professional aerial workers in Australia building dams, tramways, and trails used specialised tools and techniques, skilfully engineering complex infrastructure on the vertical, often with drilled anchors.

By contrast, Australians climbing for sport avoided the use of 'tackle' (as climbing hardware was sometimes called then). By 1910 in the Grampians, Australian climbers were adept at free climbing on vertical terrain using the human-chain belay techniques outlined by George Abraham in The Complete Mountaineer (London, 1908). Leaders could be helped over a steep section with a shoulder stand, and following climbers would spread out, assisting others inchworm style, or sometimes just solidly holding on at a good stance, as an additional human anchor in the belay chain.

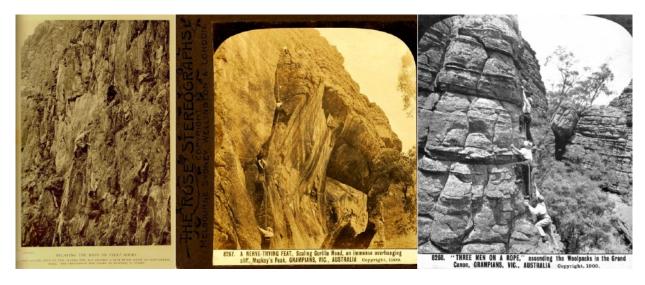
Ascents of landmark summits involving technical rock climbing were often newsworthy, such as Henry Mikalsen's solo ascent of Crookneck (Mt. Coonowrin) in the Glasshouse Mountains in 1910, reported as "hazardous, yet meritorious performance"

climbs of this nature became sought after objectives for subsequent daredevil scalers.

In the Tasmania high country, bushwalkers and alpinists were climbing at a high standard on rocky crags and on mountain traverses, notably the Skyline Traverse on Cradle Mountain, by visiting Austrian alpinists Franz and Julius Malcher in 1914.



The Nimbin Rocks, Cathedral, and the Needle from the North. Central to Indigenous Australian's cultural heritage, climbers were also inspired by these peaks and formations.



Left: George Abraham's The Complete Mountaineer (1908), and similar human-chain belay techniques captured by George Rose's stereographic images in the Grampians, Australia (1909). Abraham recommended the least experienced members to be in the middle.

Regional Australian Clubs

In the 1920s, regional rock climbing and mountaineering clubs begin to flourish. In Queensland, an epicenter of early Australian rock climbing, Bert Salmon and a cohort of climbers were free climbing at a high standard. "Salmon opposed the use of any artificial aids, including rope, using it only occasionally to safeguard new members of the group he referred to as 'The Crowd' or on challenging new ascents." *Micheal Meadows, email correspondence, 2023).

In Tasmania, a 1929 Mercury news article entitled "Rock Climbing" noted the Mount Wellington cliffs above Hobart offered "better sport than (cliffs) in England," and records the formation of a local rock climbing club, while also recommending the "right kind" of imported ropes, "so that the pastime, which calls for skill and care, can be successfully indulged."

In the Blue Mountains, steep technical tourist trails had been constructed around Katoomba for decades, but by the late 1920s, landmark testpieces like the Three Sisters involved bold free climbing and route-finding skills. "Eric Dark's 'Blue Mountaineers' or 'Katoomba Suicide Club' as the cohort were also called, opposed to the use of artificial aids in climbing. They experimented with 'heavy iron pitons' made by a local blacksmith, but dismissed them as being 'more trouble than they were worth' .They also used what they called an 'unethical instrument' to secure anchors on Castle Point and on the first Sister. It was "a two metre long ice axe with a deeply curved pick and a notch to hold the rope where the shaft entered the head" (Ibid, 2023).

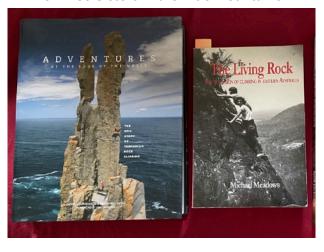
In the 1930s, rock climbing became a popular activity in Australia, but besides the mention of 'heavy iron pitons' on a few climbs in the Blue Mountains, there is little other evidence of the adoption of rock climbing hardware until well after WW2.



'After Snow, Mt. Wellington', watercolor by Max Angus (1914-2016), an early Organ Pipes climber.



The Three Sisters in the Blue Mountains.



Sources and further reading: Adventures at the End of the World (Tasmania) by Gerry Narkowicz and Simon Bischoff (2019), and The Living Rock, Michael Meadows (2015).

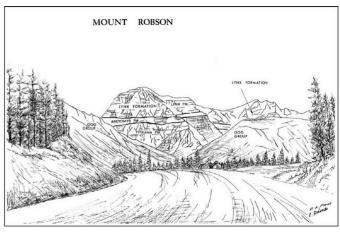
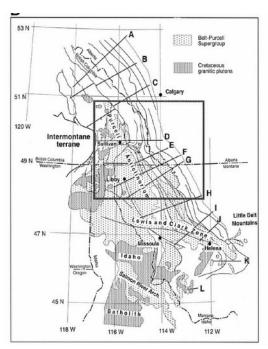


Figure 2-13: Sketch of the southwest side of Mount Robson (from Price et al., 1972). View northeast from Highway 16.

Mt. Robson. Photo A.O. Wheeler (CAJ 1930)

Horizontal geologic layering of Mount Robson.



Pigeon Spire No. 3—Bugaboo No. 2 Marmolada

Photo, A. H. MacCarthy
GROUP OF SPIRES, SEEN FROM SOUTHWEST

The fantastic granites of the Bugaboos and Idaho.

The Howser and Bugaboo Spires, Purcell Range. Canadian Alpine Journal, 1917, A. H. MacCarthy



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Canadian Challenges

One might imagine that because pitons were developed primarily on sedimentary limestone rock types of the Eastern Alps, then the mostly limestone Canadian Rockies would have also been a great place for pitoncraft to flourish. Not so. Unlike the steep vertical cliffs in Europe, the limestone/ dolostone of the Canadian Rockies is much more broken and mixed with sedimentary shale layers, so the challenges involve primarily cold mountaineering techniques and strategies. There was generally not much middle ground regarding acceptable use of pitons between an occasion pitonbelay anchor, and full-on piton-to-piton "winching", so in Canada pitons were not welcome for the challenges at home. If a climb needed hardware, it was better to look elsewhere, and ascents involving known piton use—often by overseas climbers were largely ignored in the early years, and even well into the 1950s. The exception to the rule was in the Bugaboos in the Purcell Range (Columbia Mountains), an exposed granodiorite batholith, more similar in geology to the steep granite of Yosemite than to the limestones of the Canadian Rockies. By the later 1930s, bold early big rock wall routes in the Bugaboos, only made possible with expert pitoncraft, were acknowledged and reported as very difficult climbs, with details of the techniques and the exact piton count published. But were these the first pitons in Canada?

The Canada Question

It is difficult to say when pitons were first used as points of protection for "modern" rock climbs in Canada. In 1916, Conrad Kain's rock routes in the Bugaboo Group were the hardest and most technical in North America. Kain had first seen the imposing granite spires then called "The

Nunataks" in 1910 during a survey of the Purcells with A.O. Wheeler, which he compared with the steep multi-ptich rock routes of his prior extensive piton-protected climbing experiences in the Alps (see prior chapter). Thorington writes of Kain's first sight of the "magnificent spires" of the Bugaboos:

"Here were pinnacles and towers like the needles of Chamonix shooting toward the sky, their roots in a splendid glacier. This would be a battle ground; not only muscles, but all the tricks and art of climbing would be required. Conrad was thrilled, regretting only that time did not permit him to remain and attack them at once."

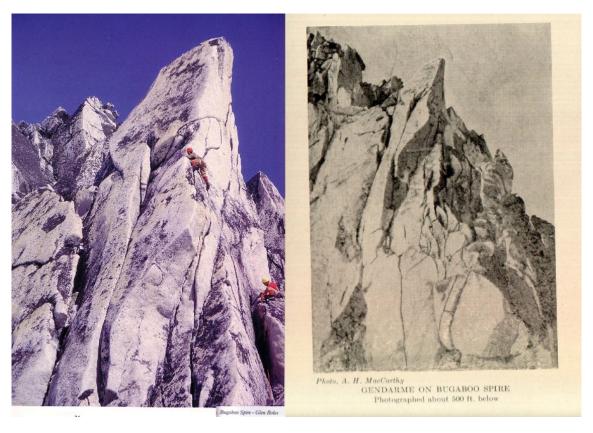
In August 1912, after his work in the Altai Mountains, and on his way to New Zealand, Kain visited Vienna and purchased a new ice axe and other climbing gear at Mizzi Langer, where pitons were also sold. A gentleman's guide in Canada at the time would never advertise the use of pitons, so it's difficult to say without evidence whether he brought any pitons back to the Purcells for his routes in 1914 (Farnham Tower), 1915 ("additional climbs"), and 1916 (Monument Peak, Howser and Bugaboo Spires). But having previously seen these granite objectives, and with all Kain's prior pitoncraft climbing in the Eastern Alps, combined with his devotion to offering the best (and safest) guiding service to his clients, it's easy to imagine he would have appreciated how an occasional piton would be great insurance to keep his clients safe if there was no other natural anchor at belays³⁶. The Swiss guides, with their two-guide system—one guide always with clients at belays—would have likely have considered an artificial anchor to safeguard clients as cheating.

³⁶ footnote: On the tricky Gendarme pitch on the south ridge of Bugaboo Spire, Kain laments there was no "projecting rock, or crack for anchorage." A hammered piton was the most common "anchorage" for a crack.

In 1938, Percy Olton reports, on what was possibly the second ascent of Bugaboo Spire (as no record of an earlier repeat seems to exist):

"The next day we set out to repeat Conrad Kain's climb up Bugaboo Spire, and repeat it we did almost to the last detail. We followed up the easy rock on the S. ridge to a point just below the first tower where we changed to rope-soled shoes. We then worked our way up the cracks in the face of the tower, finding a **piton** near the top to prove we were exactly on the route used before. When we came to the Bugaboo gendarme we pulled up short, as Kain had done, and looked for the easy way around which doesn't exist."

History would be clearer if more details of this piton were recorded, as many historians are fond of inspiring awe of early climbs noting the lack of comparative technical gear of today, so we often see, without clear evidence, the claim that Kain used no pitons on his Canadian climbs. Kain certainly came to Canada with the skillset to safely climb hard steep multi-pitch rock routes with pitons. Though it is not possible to say for certain if Kain initiated pitoncraft to Canada, the shift from guided to guideless climbing was no doubt influenced by his single-guide technique, and this in turn, drove the need to establish piton belays on long rock climbs, as the single-rope two-person system was more efficient for complex steep vertical routes.



The Gendarme on Bugaboo Spire, was considered by Kain as one of the hardest climbs he ever did. Kain describes this pitch in great detail, as so others who followed, often in wonder of Kain's path. Kain did not place any pitons on this bold lead, though later parties added pitons on this pitch for protection (images: Glen Boles and CAJ, 1917).

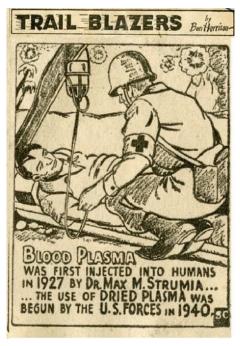
Lightweight protection vs. 'tool-shop engineering'

In Europe in the 1920s and 1930s, it is true, that complex double-rope pure aid climbing techniques were being developed on the vertical and overhanging cliffs of the Dolomites, but there were also advancing standards of harder and more elegant mixed free/aid lines up steep rock faces, with lightweight pitoncraft protection systems. This new system of climbing hard multipitch rock climbs was ignored in many parts of the world, despite a vague awareness of the methods and tools, and of the remarkable routes that were being ascended. Nevertheless, pitons were key for a number of remarkable Canadian climbs in the 1920s and 1930s by overseas climbers, and these in turn led to further development of techniques for the greater bigwall challenges around the world.

Max Strumia (1896-1972)

In the 1920s, Massimo Strumia (later Max Strumia) began climbing in the Rocky Mountains of Canada. Strumia was an Italian/American climber who in 1920 migrated to the USA to study medicine, and who later published hundreds of scientific medical papers documenting new discoveries. Over his career, he travelled frequently between Europe and North America for both medical work and climbing. For his pioneering medical work in blood and plasma, he was awarded the

Knight Cross in Italy, and a Presidential Citation in the USA³⁷.



Max Strumia's medical contributions recognised in a Ben Harrison cartoon from the 1940s, alongside Fleming and Pasteur.

An early member and contributor to the American Alpine Club³⁸, Strumia represented the AAC at the Congres International d'Alpinisme in Cortina d'Ampezzo in 1932. More than anyone else in the 1930s, with his multi-national climbing experience, Strumia raised awareness in

³⁷ Footnote: The first recorded use of plasma to save a life instead of whole blood was by Dr. Max Strumia in 1934. Dr. Amy Givler (my sister) looked over one of his hundreds of papers published before WW2: "This paper describes injecting plasma, which is the part of blood that doesn't have cells (red and white blood cells). People who have lost a lot of blood need more volume. But in the field of war you can't figure out what the person's blood type is. If you inject the wrong type blood, the person will die of the mismatch. So he injected plasma which filled the soldiers' veins again, saving their lives."

³⁸ Footnote: Strumia's "Moods of the Mountains and Climbers", published in the very first American Alpine Journal (1929) is an inspiring article that captures the spirit of mountain climbing and being present in the mountains. Highly recommended! (this article could well be read and referenced in articles of Csikszentmihalyi's Flow ideas as applied to climbing, btw). See also Hickson, AAJ 1931 [J.W.A. Hickson makes the first mention of pitons in the CAJ in 1911, referring to finding a "couple of suspicious pitons, quite suitable (though not employed by us) for mountaineering purposes" at 7,200' camp near Baker Creek, six hours from Lake Louise--possibly Konrad Kain's?].





THE PREPARATION AND PRESERVATION OF HUMAN PLASMA*

IV. DRYING OF PLASMA FROM THE FROZEN STATE BY LOW TEMPERATURE CONDENSATION IN VACUO

MAX M. STRUMIA, JOHN J. McGRAW AND JOHN REICHEL From the Laboratory of Clinical Pathology of the Bryn Mawr Hospital

Drying of biological substances for the purpose of preservation is now accepted as a safe and adequate procedure when properly

Dried plasma has a definite place in modern therapeutic armamentarium, because it permits asse and prolonged storage attrainsportation under adverse conditions. Furthermore, it may be reconstituted in a concentrated form, for the treatment of certain conditions, particularly edema of the brain.

It has already been mentioned that human plasma and serum, as well as other biologicals, such as guines pig complement, as well as other biologicals, such as guines pig complement,

It has already been mentioned that human plasma and serum, as well as other biologicals, such as guinea pig complement, thromboplastin proparations, and prothrombin, are even better and much more simply and economically preserved by freeding and maintenance in the frozen state. The preservation of most plasma in the frozen state and a small portion in the dried state will meet all requirements.

Essential points of drying to be considered in order to maintain as many of the original properties of the plasma as possible are: (3) The original liquid plasma must be fresh, and must meet the requirements set forth in our previous articles, and those of the National Institute of Health applicable to the preparation of dried plasma,

(2) Plasma must be prefrozen and dried from the frozen state,

* This research was aided by a fund donated by Mrs. John S. Sharps, Mrs. Edward Law, the Women's Board and the Social Service Department of the Bryn Mawr Hospital and a grant from the National Research Council.
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Max Strumia, who continued research until his death in 1972, pioneered blood and plasma methods which saved countless lives. The first recorded use of plasma to save a life instead of whole blood was by Dr. Max Strumia in 1934. In the 2012 book, The Red Blood Cell, by D. Surgenor, Max Strumia is called, "one of the true giants of red cell research". See also: The Story of Blood for Shock Resuscitation: How the Pendulum Swings (2021). The Sharpe-Strumia Research Foundation of Bryn Mawr Hospital honors Max Strumia's contributions. (photo credit: National Library of Medicine).

North America of the new tools of climbing that had been developed in the Alps in the prior decades, with articles including, "Old and New Helps to the Climber" in the 1932 American Alpine Journal.

Born in Turin, Strumia started climbing in Italy and France when he was teenager, climbing over 70 mountain routes in the western and central Alps before moving to America. On his first trip to the Canadian Rockies in 1924, Strumia joined A.J. Ostheimer and J.M Thorington, who had engaged Conrad Kain for an expedition to Athabaska Pass, whereupon they climbed a number of significant first ascents.

These summits involve significant challenges to find suitable routes to access the range, and were primarily climbed with mountaineering techniques (moving rope belays for exposed and crevassed areas, moderate rock climbing, chopping steps in steep ice, etc.). Strumia was also involved with the scientific mapping of several complex high-level glacier routes that weaved within the Canadian ranges, such as the route from Jasper to Field, and during

AIGUILLE SAVOIE (11,900 FEET)

(Second ascent of the southeast ridge, descent by the southeast face)

The first ascent of this ridge was made by Paul Preuss, solo, August 13, 1913, in four hours, from the Triolet hut.¹

On August 13th, 1931, our party reached the Triolet hut of the C. A. I.² from Savojan in two hours and a half. The hut was left at 3 a.m. next day, and following the moraine and glacier, the party reached the base of the ridge at a height of about 10,660 feet. The climb is up open chimneys and very steep placques of solid rock, sometimes along the ridge (gendarmes), sometimes a little to the right of it. The ascent is very interesting and of moderate difficulty.

The summit was reached at 8.15 (five hours and fifteen minutes from the hut) and the descent was begun at 8.45, amidst an extremely violent snowstorm. The southeast face was traversed diagonally, and in the last portion the couloir descending from the Col de Talèfre was followed. This appears to be subject to stone fall. The bergshrund was wide and high, and had to be jumped. Return to the hut at 1 P.M.

The party was made of two ropes, the first with Evaristo Croux, guide, and Max Strumia; the second with Francesco Ravelli, Abrate and Passerin D'Entrèves.

MAX M. STRUMIA.

Stumia's 1932 American Alpine Journal report of the second ascent of a Preuss route on Aiguille Savoie in the Alps, an 800m ridge still today noted as "not to be underestimated" and a "long, long, long and fine climb". The report also appeared in the Italian Periodici del CAI. THE INTRAVENOUS USE OF SERUM AND PLASMA, PRESH AND PRESERVED*

MAX M. SERUMI, M.D., JORENI A. WARSER, M.D.

AND

J. PREDIERCE MOMERIAN, M.D.

THE INTRAVENOUS USE of serum and placema in place of whole blood is not new. The number of contributions on this subject has greatly increased

One of us has been increased in this problem intermittently since and 1207, or which the human enture as an intermently admirated in one state of the problem of the proble

Of recent years, the intravences injection of blood plasms in place of which blood has bose much the object of intense study by the Staff of the Bryn Mawer Rospital. Both serem and plasma have been used in Infections," in the prophylaxies and tentiment of intrivitional hypogenetiments and america resulting therefrom," in herra, "b." in certain hemorrhagic and hemolytic classus, in peredictingle states, in Five disease," in closens collists, and, finally,

It is not the purpose of this communication to evaluate the clinical results of the use of plasma in the statious conflicture enumerated nor to discuss the *This investigation was sided by a special Resurch Faul established by the Women's Board of the Brym Maser Hospital. Scholinted for publication Petruary 12, 1033.

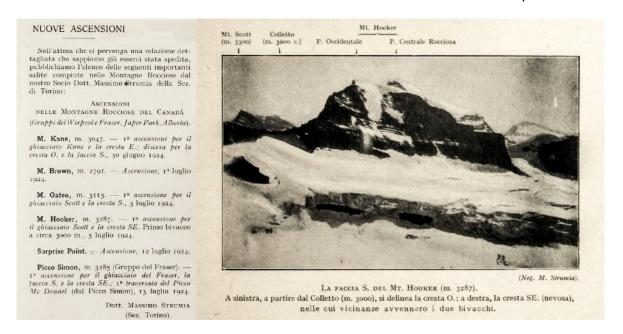
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rationale of whole black translations, but rather to enablastice the simplestic programme and the simple in the same compared to which the state and the same part of programme and the same part of the same part

these tours and on other expeditions, he racked up a considerable record of climbing in the Canadian Rockies.

Strumia was also drawn to the steep multipitch rock faces of the Rockies and in the 1920s summers, he climbed in Canada with Thorington, Kain, and other guides, followed by a number of successful trips with his "perennial companion" Bill Hainsworth (AAJ, 1972). Strumia's routes often involved the modern piton climbing techniques; on a new route attempt on Mt. Robson in 1930, he placed two pitons, and in the Sunwapta Valley, on a mountain briefly named Piton Peak³⁹, Strumia notes, 'The rotten snowcovered rock proved difficult. It was negotiated with the aid of three pitons and safety snap-rings, and provided a highly exciting climb for the leader and a cold one for the lower end of the rope."

More interesting medical history. Max Strumia recounts the developments in plasma research since 1927.



1924 Canadian climbs reported by Max Strumia (1926 Club Alpino Italiano journal), a 12-page report of his Whirlpool group climbs. In the 1940 A Climber's Guide to the Rocky Mountains of Canada. Palmer and Thorington note that Mt. Brown and Mt. Hooker, in particular, had gained mythical status, as they were difficult to access, and were once claimed to be the highest in North America— the summits visible from distant points.

³⁹ Footnote: "Piton Peak" was later named Mount Englehard in 1966, after American mountaineer <u>Georgia Engelhard</u>. See also, "Climbs in the Canadian Rockies, 1926" (Alfred Ostheimer) in the December 1927 The Geographic Journal, published by The Royal Geographical Society, and AAJ 1931, AJ 1933, CAI 1926.

Mt. Oubliette (Strumia/ Hainsworth/Fuhrer, 1932)

Strumia and Hainsworth, with the guide Hans Fuhrer, climbed the first ascent of Mt. Oubliette in 1932. The route went relatively unnoticed in Canada and is listed as "unnamed" in the 1940 Thorington/Palmer guide, noting the use of "piton and ring". Although this climb does not appear in many (any?) modern Canadian climbing histories, the 1932 American Alpine Journal noted it as "surely one of the most difficult of the whole chain" of the Rockies. The 1933 British Alpine Journal devotes eight pages to the ascent as one of the more challenging technical ascents in North America at the time. In addition to describing their tactical use of pitons to make the ascent possible, Strumia and Hainsworth's report also provides one of the first clear descriptions of how pitons were used as an emergency retreat tool.

There is a lot more that could be added to Strumia's story⁴⁰, as he is one of the most interesting early members of the American Alpine Club. Strumia documented his climbs in Italian, American, and Canadian, and other international journals, and his sharing of advanced tools and techniques of climbing clearly influenced the development of bigwall techniques in North America. By globetrotting between Europe and North America, climbing the 'testpiece' routes on both continents, Strumia was both learning

and sharing all the latest developments and exciting adventures to be had.

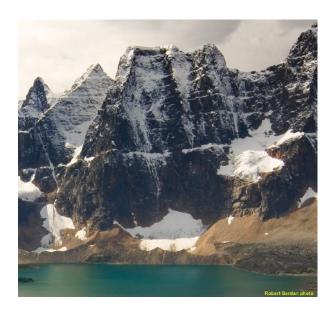


Like Conrad Kain, Hans Fuhrer was another Canadian mountain guide adept at pitoncraft in the 1920s and 1930s.



Young and old heros (1952).

⁴⁰ Footnote. J. Monroe Thorington, chronicler of Conrad Kain, wrote the obituary for Max Strumia in the 1972 American Alpine Journal, and includes an extensive resume of climbs in the European Alps, including the Grandes Jorasses. Although Thorington sometimes referred to piton techniques as siege tactics, he participated in several cutting edge climbs of this caliber: "There they were turned back by a succession of broken towers, which will require more time, much rope and special technique if they are to be overcome. We were unprepared for long siege tactics. As it is, several pitons now grace this ridge. On the following morning we left for Fortress Lake."(report on North Wing of the Columbia Group and other writings of Thorington.) James Monroe Thorington, who was president of the AAC from 1941-1943, was noted in 2002 by past president Jim Frush (who I served under as AAC board member) as "the ultimate scholar of alpinism for the Club and involved in producing a long series of guide books for the Club."

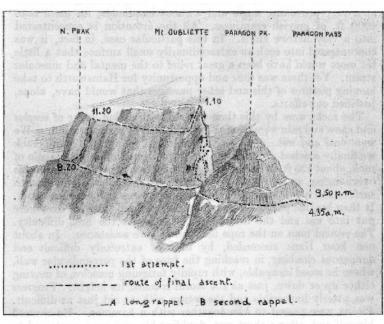


Oubliette Mountain. Oubliette is the french word for 'to forget', and denotes the dreaded basement room of a dungeon which is only accessible from a hatch or hole from a high ceiling, and requires a rope to enter and exit.

The rocks were by this time covered with a thin layer of verglas and snow and rain were coming down, driven by a strong wind. were cold and wet. Leaving the ledge and following a short crack we finally reached a portion of the ridge formed of an open angle of rock, about 120 ft. in height. The first portion above a platform was overhanging, and then proceeded at a very steep angle with smooth surface and a few abortive holds, leaning downward, for about 60 ft. It then became perpendicular. Shoulders, hands and ice axes were put into use and the leader was helped over the first difficulty. The second man on the rope followed to give assistance. In about one hour Hans succeeded, by dint of extremely difficult and dangerous climbing, in reaching the base of the perpendicular wall, where he stood incapable, with rapidly fatiguing muscles, of moving either up or down, just as the storm reached its height. Progress was utterly impossible and the return without aid just as difficult. Pitons were passed to him together with a hammer. He secured himself and, after a short rest, doubling his own rope, contrived to slide down. It was 3.30 when we turned back, 200 ft. from the summit. We could not return by the route of the morning. We kept away from the ridge towards the western face. Two more pitons and a rappel, under an extremely violent and cold wind with snow, brought us at 6 P.M. to the Oubliette-Paragon col.

Strumia/Hainsworth account of their first attempt on Mt. Oubliette in 1932, describing the belayer sending the piton and hammer to the leader who could not downclimb to safety--one of the main justifications for bringing pitons for cases of emergency retreat on bold forays.





Figures indicate time of final ascent. A also represents highest point reached in first attempt.

Strumia reports on the first ascent of Oubliette in 1932, "Then came a steep, difficult step with an overhang, followed by a 25-ft. vertical slab of great difficulty, which a piton and Karabiner made however reasonably safe."

Postscript: Canadian first documented pitons

Ok, so when were the first climbing pitons in Canada first documented for a cutting-edge climbing objective? I posed this question to Chic Scott, who has written the most complete history of Canadian climbing, and he responded:

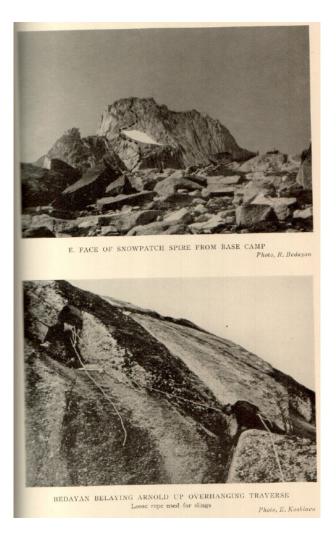
"There is an instance of Frank Smythe using a piton on Mount Colin near Jasper about 1947, (a topic of discussion at the time, and published in Smythe's 1950 book, Climbs in the Canadian Rockies). The first ascent of Brussels Peak in 1948 by two Americans involved a number of pitons and some bolts. It aroused quite a reaction. The old-time ACC folks in Canada were very opposed to pitons. You should take a look at "The Ascent of Dumbkoff Tower" by Bob Hind in the CAJ." 41 It seems likely that the 1938 climb on Bugaboo Spire involved the first use of pitons in Canada. I think Tony Cromwell and Georgia Engelhard climbed in the Bugaboos before 1938 (referred to in the article cited above) but I have no idea what they did or if they used pitons."

I was surprised that equipment wasn't better documented, but also realised that my frequent imagining of the exact climbing kit each mythical ascent I had eagerly read and dreamed about since my early days of climbing, was not part of the general historical interest. I recalled the 1940 bigwall ascent of Snowpatch Spire in the Bugaboos (which Chic covers well in his book). The climb was an early cold weather proving grounds for the bigwall techniques being globally developed.

In *Big Wall Climbing (1974)*, eagerly read by bigwall aficionados, Doug Scott describes the 1940 ascent of Snowpatch Spire, the last of the Bugaboos to be climbed and the

most difficult, as the "first remote rock climb using the Yosemite techniques."

The route involved an ample rack of well-crafted pitons and carabiners, and was vista-opening. Raffi Bedayan's 1941 AAJ article, "A Bugaboo No Longer" described



Topo of 1940 ascent of Snowpatch Spire, and climbing shot from Raffi Bedayan's 'A Bugaboo No Longer' in the 1941 AAJ. Tension traverses and two points of aid were noted.

⁴¹ Footnote: Bob Hind appears to be a rival to Max Strumia, both seeking similar kinds of steep rock objectives in the Canadian Rockies in the 1930s. In 1936, they both attempted to climb first to the summit of Brussels Peak as members of separate teams, Strumia's team required pitons for the ascent. It is not clear whether Hind actually used pitons on any of his climbs as he condemned them in story.

the exposed dependence on gear manoeuvring up the giant wall required a high level of efficient pitoncraft whilst suspended on airy perches and runout climbing in a wild environment, adding a whole new dimension to bigwall climbing in North America.⁴²

Such are the games climbers play. As someone always more interested in the big rock walls of the world, my knowledge of big mountains is peripheral, so I appreciated the comprehensive history of Canadian mountain routes in Chic's *Pushing the Limits*.

I wondered about the 1925 route on Alberta, one of the first big rock routes on a big mountain, as I had read the route description countless times in Steve Roper and Allen Steck's *Fifty Classic Climbs of North America (1979)*. The recommended equipment for Mount Alberta⁴³: "Carry ten pitons and ten chocks, as well as ice axes for the summit ridge." What size, I wondered?

Thorington only wrote a very brief description of Mt. Alberta in his 1940 guidebook, which at the time the route had not yet been repeated:



Photos by the Japanese Party

SOUTH AND EAST FACES OF ALBERTA

Route of ascent; X shows summit bivouac

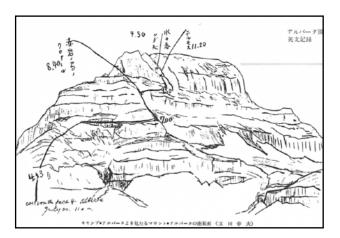
Mt. Alberta (11874'): 1925 first ascent by S. Hashimoto, Hatano, T. Hayakawa, Y. Maki, Mitai, N. Okabe, H. Fuhrer, Kohler, J. Weber. From camp meadow (6800') at head of Habel creek, via S. and E. slopes and central portion of E. extreme N. end which is highest point. (Loose rock and falling stones; night was а spent at 11000'; four pitons used roping-off during descent; upper of the mountain difficult.) Ascent: 16h; descent: 16h.44

⁴² The southeast shoulder of Snowpatch Spire had been attempted by Fritz Wiessner and others, and was known as a "last great problem" in the Bugaboos before Jack Arnold and Raffi Bedayan completed the route to the south summit (Wiessner later wrote that he was uninterested in "merely and affair of driving iron into virgin rock.") Bedayan writes, "Those who follow the route should not be susceptible to acrophobia. We used a 120-ft.,1/2--inch Manila hemp climbing rope, and a 200-ft., 5/16--inch rappel. Pitons were used in twenty-three different places; of these two were used for direct aid. Alpine big walls in Europe of this era were equally committing, e.g. the Walker Spur on the Grandes Jorasses in 1938 as one of many examples, see Vol. 1.

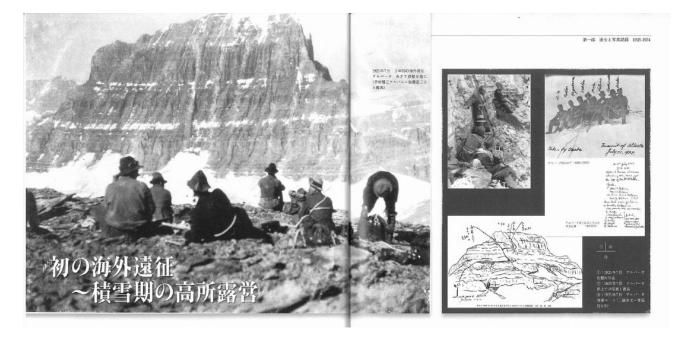
⁴³ In 50 Classic Climbs, Roper got the first names of Hans Fuhrer and Heinrich Kohler reversed, apparently, and this mistake comes from the James Weber report of the climb translation. When Roper and Steck published their dream guide, the route had been climbed less than a dozen times and was rated IV, 5.6. Ten pitons and ten chocks, as well as ice axes for the summit ridge, were recommended for the Japanese Route on Mount Alberta in 1979.

⁴⁴ footnote: These "roping-down" pitons are also referenced in an <u>article in the CAJ</u> by John Oberlin, providing for the first time in 1953 a translation of guide Jean Weber's account of the 1925 first ascent. Pitons might have also been used for the ascent, it is not clear, as this route and others were ignored in English media for decades. But we now know that Yuko Maki, who led the expedition, was becoming one of the best technical climbers in the world at the time, and that Japanese climbing technology was advancing.

The 'Japanese Route' received very little fanfare at the time, and it wasn't until the route was "rediscovered" in the 1953 American Alpine Journal that climbing historians acknowledged the significant milestone it was⁴⁵.



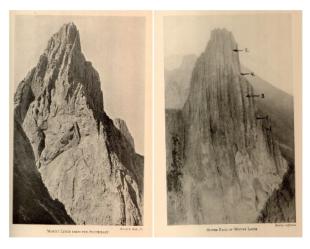




Original photos and sketches of the Japanese Mt. Alberta expedition in 1925, Courtesy Naoe Sakashita

⁴⁵ Footnote: Noted Canadian climbing historian Zac Robinson tells the story in a nutshell: "I have climbed the 1925 route ... and it's loose; ha! Interestingly, it's Thorington's guidebook -- the first edition (1921) -- that lures the Japanese over in the first place. In that edition, Mount Alberta features as the frontispiece, and under it the alluring caption, "A formidable unclimbed peak of the range." The complete disregard of the Japanese ascent in the 1925 CAJ (it receives a one-line statement of fact in the back matter) says volumes about the ACC in the 1925. Racism, unquestionably -- but the use of those four pitons would have been looked-down-upon, too. One has only to read about what CAJ contributors were saying about pitons a decade or more later, in the 1940s and 50s, to see how entrenched those prejudices were (See R.C. Hind's "The Ascent of Dumkopf Tower" [CAJ 34, 1951] - a parody on the first ascent of Brussels Peak). Frank Smythe was leading the anti-piton charge in those days... despite having to use a piton himself on the first ascent of Mount Colin, which he claimed he always "regretted." (email 16/6/2022)

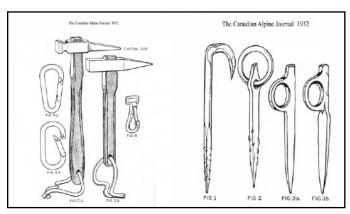
Other Canada piton notes



The limestone tower of Mount Louis in the Sawbacks, Canada, was first climbed by Conrad Kain and Albert MacCarthy in 1916. In 1928, AMC member Beverly Jefferson swung leads with Bradley Gilman on the SE ridge route using pitons for anchors and key manoeuvres (AMC Bulletin, June 1928). By the 1930s pitons were standard equipment for Mount Louis (see CAJ 1930).



Edward Woolf, E.R Gibson, and the Canadian Robin Hind climbed the Dungeon in 1933 using a few pitons. Hans Fuhrer had attempted the peak with Gibson two year prior in 1931.



Canadian Alpine Journal, 1932. Robert Underhill's article in the 1932 CAJ introduced the basic principles of piton protection systems to Canadian readers, but the article did little to soften the Canadian antipathy to such hardware.



Bugaboo Spire, in the Purcell range in Canada, first climbed in 1916. In July 1938 Percy Olton repeated the Kain Route "almost to the last detail" and discovered pitons below the Gendarme. That same season, Fritz Wiessner "put in a lot of pitons" to surmount an overhang on Snowpatch Spire, but then "gave it up and returned to camp leaving behind considerable ironmongery to mark the scene of his efforts." (AAJ, 1939).

Climbing technology in Japan (notes)

The 1925 Alberta ascent raises the question of the technology employed for the climb, but also of the early years of mechanised climbing in Japan. I have collected a few of the only resources (e.g. the Japanese Alpine Centenary 1905-2005. celebrating 100 years of one of the earliest national alpine clubs in the world, and translations of Sanko, Sangaku & Japanese Alpine News articles, but there is very little translated public research material on the innovators of climbing equipment made in Japan. This field of research could benefit from a bilingual researcher with knowledge of the engineering aspects of climbing technology.46

The strong and light silk climbing ropes used in the 1920s had greater ability to absorb energy safely than the standard manila and hemp climbing ropes. Only a very few silk ropes were imported and used on climbs in North America, as they were very expensive. Silk fibre ropes were also produced in France. Silk ropes were the first dynamic climbing ropes prior to the development of nylon ropes. See also Volume 1: rope technology.47



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Practice climb in Japan, 1922.

Details of the 5m pole.



Silk ropes from Japan were probably the first strong "dynamic" climbing ropes. Silk ropes used for climbing were also made in France in the 1930s. Courtesy Whyte Museum.

⁴⁶ My friend Naoe Sakashita who I know has always had a sharp eye for the most cutting-edge climbing tools (as he ordered dozens of A5 Portaledges from me back in the 1990s for his Lost Arrow distribution business;) has been helpful in providing info.;)

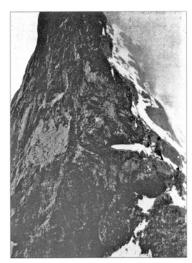
⁴⁷ Not included in this technology review, are developments in China and other areas in Asia, where advanced vertical path building skills established safe passage along cliffs. Better histories could be written in English of the cliff and rock climbing developments in Asia, esp. Sichuan and other areas abutting the Himalayan Plateau.

Eiger East Ridge (1921)

Prior to the Alberta ascent, Yuko Maki (1894-1989) climbed the Mittellegi ridge with the Swiss guides Fritz Amatter, Fritz Steuri and Samuel Brawand, a celebrated first ascent in September, 1921.

The team brought four types of pitons (30 in all), wooden wedges, hammer and drills, two 30-meter ropes, one 60-meter rope, and a 5-meter pole. The pole had two spikes at the bottom and a hook for the rope on top. The climbing rope was looped through the hook at the top of the pole, to give the leader aid and some protection from above. Brawand justifies the tools in the 1928 Swiss Alpine Journal:

"The remark has been made that the 'pure mountaineering' first ascent of the Mittellegi still remains to be done, since poles and nails were used in our ascent. I emphasize here that such writers probably don't know what they're saying, or they're mouth heroes, who judge from the desk without being able to solve the task better themselves. According to these apostles, there will probably be no "flawless" first ascent of the Mittellegi route at all, since fixed ropes are now attached. No, let's be honest. Without the aforementioned aids, especially without the pole, the Mittellegi would probably still be unclimbed today. "



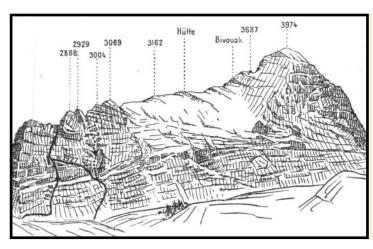


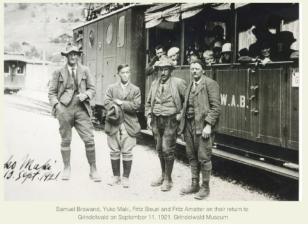


The 5m pole in action.

Pitons were the Mauerhaken type, as the rope was reported to be looped over them, and there is no mention of Karabiner (flat ring pitons were also used). Holes were drilled into the rock with hammer and chisel, and filled with wood wedges as aids in the ascent. The climb highlights the advancing willingness to implement novel tools for big rock climbs at the time.

After the ascent, Maki donated 10,000 Swiss Francs for the construction of the Mittellegihütte (marked on the drawing below as 'Hütte). In 1926 Maki climbed the Matterhorn with his benefactor, Prince Chichibu, and in 1956, he led the Japanese expedition to Manaslu.





First complete climb of the Eiger Mittellegi. Between point 3687 and summit is where the 5m pole was used.

State of the art climbing hardware, 1932

VARIOUS NOTES

OLD AND NEW HELPS TO THE CLIMBER

Notwithstanding feeble protests by a few climbers, mostly of Notwithstanding teeble protests by a few climbers, mostly of the past generation, hammers, pitions and safety snaps have defi-nitely entered into modern climbing technique. More recently they have been used on ice with excellent results. The notes that follow have no pretense to be complete or new; they are simply offered to inform other climbers of the range of these aids that are available and to present a few particulars regarding their

Notes to Figure 1

A1. Piton hammer; measures 24 cm. in length and weighs 370 gms.

A2. Another piton hammer, of German make, measuring 23.5 cm. in length and weighing 397 gms. The second hammer has the advantage of a hard, sharp point, to open small fissures and facilitate the introduction of the piton in the rock. However, it delivers a less effective blow, and it is more difficult to carry. Type A1 can be easily slipped in one's pocket or safely hung to one's belt; it is made of rather soft steel.

- B1. Triangular, soft steel piton, measures 18 cm. in length and weighs 167 gms.

 B2. Quadrangular, soft steel piton, measures 15 cm. in length and weighs 166 gms. Both B1 and B2 are provided with a ring and are, therefore, suited for roping-off. They are very strong and because of their thickness they fit only rather large cracks. They are of a type very popular years ago in the western Alps, where they were used mostly to secure permanent cables to rocks.
- C1. Simple piton of soft steel, measures 16.5 cm. in length and weighs 115 gms.

 C2. Same as C1, but measuring 14.5 cm. and weighing 92 gms.

 C1 and C2 are inexpensive general utility rock pitons, suitable for roping-off, or for use with safety snaps. They are somewhat thin, but if driven in at least two-thirds of the shaft, they are very secure. They can be easily made by any reliable blacksmith from stock material. They should be driven into the rock with the curved portion upward. curved portion upward.
- D1. Safety snap (carabiner), 11 cm. long and weighing

528

Various Notes

Notes to Figure 2

A relatively new type of sack, provided with a duraluminum tube frame and an ingenious system of straps that bring the weight of the sack well under the arms, rather than giving the customary pull backwards. It also has a wide strap that keeps the sack away from the back, eliminating perspiration. It is provided with a leather belt for strapping in front, thus eliminating dangerous motion of sack on sideway passages. It has two long side pockets and one large posterior. It is of large capacity and weighs 1.820 ems.

Notes to Figure 3

The best ice crampon yet devised, designed and constructed by Grivel, of Courmayeur. It is of the Eckenstein ten-point variety, with two additional prongs, directed forwards. The advantages of such addition are at once obvious, and on very steep hard snow their usefulness can hardly be overestimated. The lower prongs, instead of being simple points, are made after the fashion of cutting chisels, properly directed. The weight, with linen straps, for the largest size is 1,354 gms. per pair.

The type of nails illustrated in the same figure has proved very good on rough ground such as one encounters in the Canadian Rockies, although they are heavier and less efficient than an all-

Rockies, although they are heavier and less efficient than an all-

Notes to Figure 4

Notes to Figure 4

The best Klettershue are made of stout but light waterproof cloth and light leather. The soles are of soft cloth, closely and securely stitched. They should very closely fit the foot and the soles should not advance outside the foot margin. This type originated and is universally employed in the Dolomites (Scarpate-Scarpa da gatto). Climbing shoes with crepe-tubber soles or rope soles are also good but should be considered second choice. The ice-axe strap illustrated in Figure 4 is of great utility. It is made of a linen strap, secured to a steel ring which fits loosely around the wooden shaft. An iron nail, of the type used for climbing shoes, is fixed in the shaft, about 30 cm. from the tip. The strap easily running up and down, can be used to carry the ice-axe while rock climbing as well as to secure it to the wrist while step-cutting. Some climbers, instead of the nail, use a leather ring nailed around the shaft; this has the disadvantage of retaining moisture, thus producing in time a weak sport in the shaft. retaining moisture, thus producing in time a weak spot in the shaft.

This nail is the latest contribution to rock-climbing by a group of Courmayeur guides. It is devised to be used on solid granitic

Various Notes

- D2. Safety snap, measures 10 cm. in length and weighs D2. Satery snap, measures 10 cm. in length and weighs 120 gms. These safety snaps are made of hard steel, have a strong spring, and close in a very secure manner. They are inserted in the eye of pitons, and the rope in turn is passed through, thus obviating the necessity of unroping. The last climber of the party recovers them.
- E1. An excellent ice piton, of soft steel, with a hardened cut-E1. An excellent ice piton, of soft steel, with a hardened cutting edge and ring. It measures 19.5 cm. in length and weighs
 192 gms. This ice piton is ideal for hard crystalline ice, into
 which it should be driven transversally, at an angle of about
 45°, and up to its twisted neck. It can occasionally be used in
 large cracks of soft rock. During the past season I used them in
 ice by drilling a round hole, in which the piton could freely
 move. With a flip of the rope from below, the piton was easily
 recovered. Drilling a hole in which the piton can freely move is
 safer than forcing it in, if the ice is crystalline, because it avoids
 formation of dangerous and insidious cracks.

 E2. Duraluminum ice piton, with ring. It measure 25 cm. in

E2. Duraluminum ice piton, with ring. It measure 25 cm. in length and weighs 129 gms. By far the best for hard snow, because of its width and length. It should always be driven in full length, at about a 45° angle.

- F1, F2, F3. Are soft steel pitons, for vertical fissures on rocks. F1 measure 14.5 cm. in length and weighs 125 gms.; it is provided with a ring to facilitate roping-off. F2 is 15 cm. in length and weighs 98 gms. F3 is 17 cm. long and weighs 104 gms.
- H1, H2, H3. Are soft steel pitons for transverse fissures on rocks. H is provided with ring and measures 135 cm. in length, weighing 109 gms. H2 measures 15 cm. in length and weighs 94 gms; H3 measures 15 cm. in length and weighs 125 gms. Pitons of the F and H type should be driven into the rock with the curved portion downward, so that they can be utilized as footholds. Pitons F and H are by far the best rock with the curved portion downward, so that they can be utilized as footholds. Pitons F and H are by far the best rock with the measurement who were the such as an illustrated would meet. pitons, and an assortment such as the one illustrated would meet all the requirements of any grimpeur.
- G. A duraluminum piton for rock, 15.5 cm. in length, weighing 62 gms. only. It is recommended as an emergency piton, to be carried as part of a standard equipment.

Articles A2, D, D2, E2 and G are for sale by Ravelli, Corso Ferruccio 70 Turin, Italy. Articles F1, F2, F3, H1, H2 and H3 are manufactured and for sale by Grivel, Courmayeur (Italy), famous maker of ice axes and crampons.

Various Notes

rock, where no natural cracks are to be found. A hole is first drilled in the rock, using a round chisel (a) with a hard-steel point. This chisel is pierced with a hole, so that it may be secured

point. This chisel is pierced with a hole, so that it may be secured to the wrist of the operator by a stout string.

The hole in the rock should be 5 to 8 cm. in depth, and when finished, the special piton (b) is introduced in it, after the wedge (c) has been lightly fitted into the cut at the end of the piton. This is then hammered into the hole, where it will be securely retained by the forced expasion of the wedge. This spike, prepared by Grivel, made possible such feats as the ascent of the vertiginous Père Eternel and the S. ridge of the Aiguille Noire de Péteret. The piton measures 15 cm. in length and weighs 110 cms.

MAX M. STRUMIA

A HIGH-LEVEL GLACIER ROUTE FROM JASPER TO FIELD

One of the features of classical mountaineering in the Alps was One of the features of classical mountaineering in the Alps was the development of the high-level route between Chamonix and Zermatt. As originally laid down by Jacomb, in 1862, this required four days of actual climbing as follows: (1) Lognan to Orsières (Col d'Argentière). Orsières to Burg St. Pierre (the "intermediate link"). (2) Bourg to Chermontane (Col du Sonadon). (3) Chermontane to Arolla (Col de Chermontane). (4) Prarayen to Zermatt (Col de Valpelline). As topographical knowledge increased certain alterations were made and variants became customary.² became customary.

knowledge increased certain alterations were made and variants became customary.\(^1\)

Believing that it may prove suggestive to outline a comparable line of travel across Canadian snowfields, I present as a possibility a way across nevies of the main watershed from the head of Athabaska River to Field. Much of it is over ground already trodden, but short connecting links must still be worked out and may appeal to climbers who are young and active.

From Jasper to the head of Athabaska River four days with horses will be required. Then follows:

(1) a. To the Columbia icefield. By the only route through which this has been accomplished from the Athabaska valley, the Columbia glacier and the broken cliffs southeast of The Twins were ascended, a way that has little to recommend it.\(^1\) although possibly it could be improved upon. A more feasible line is opened if a satisfactory route can be found to the col immediately morth of Mt. Stuttleid (11,880 feet), between this peak and the unmaned peak (10,900 feet) to the north. Once this is attained the northern slopes of Mt. Stutfield may be ascended, the mountain traversed and the Columbia nevel attained.

The route to this objective col north of Mt. Stutfield has yet to be worked out. If the valley of Habel Creek is used, the stream,

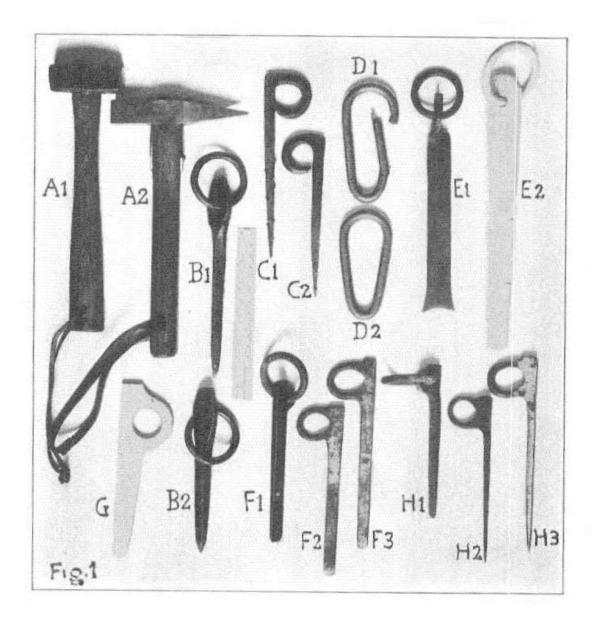


Photo accompanying Max Strumia's article, Old and New Helps to the Climber in the 1932 AAJ. A wide variety of pitons, carabiners and hammers at the time.

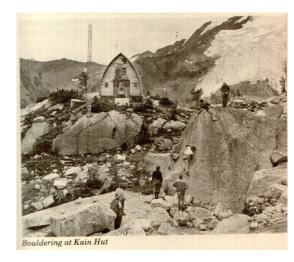
Conclusion

Often in history, the "first ascent" is widely celebrated, the attempts forgotten, and thus only a rough history is told. First, biggest, tallest, greatest, etc. are good headlines, but can get pretty boring after a while, as such records are quickly broken (though it is fun to have a "record", even if short-lived). When you look deeper into climbing history, and especially in the realm of technological

achievements—the use of most lightweight tools to optimise the elegance of an adventure—the attempts and forgotten climbs are often the real breakthroughs in terms of tools and techniques, and directly lead to the later success. The equipment innovation understory leading to the most elegant bigwall lines in the world is what my series is all about. Thanks for reading! (Note that this is how the online post ended).



Howser Spire, another of Conrad Kain's first ascents in the Bugaboos.



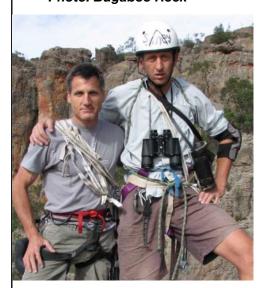
The well-loved Conrad Kain hut was built in 1972 by the Alpine Club of Canada. Photo: Bugaboo Rock

Cultural Note--The Million Guide

Conrad Kain's "best remembered story," The Millionaire Guide, is told in chapter 30 of *Where the Clouds Can Go*, the collection of Kain's writings and biography published in 1935 by J. Monroe Thorington, who footnotes, the story "was told by Kain it in the Altai, in New Zealand, and at many Canadian campfires. It is pure invention, Kain never having ascended the Gross Glockner." Although the names were changed to protect the innocent (and not so innocent) the theme would be familiar to many guides' experiences of guiding sometimes challenging clients for a living.

In the story, Kain tells of pretending to be a 'gentleman', and hires and pranks an unsuspecting guide who did not know him (but would have known of him), pretending to be bumbly when in fact he was by far a better climber than his guide. He writes how he 'acted the greenhorn', falling all the time, and asking dumb questions. The story was called The Millionaire Guide because when it was discovered Kain was an accomplished guide, people said, "What a man. When he is a mountain guide, he hires a guide to climb that easy mountain. He must be a millionaire." The story was also published in The Press (NZ) in 1916 (link).

In 1928, the story appeared in a popular collection of short stories, *The Twist and Other Stories*, by Paul Wallace, who presented it as a 'dialect version' called 'The Million Guide', "as it was told one night at the camp-fire." It begins (verbatim) in stereotypical form: "After I haf been mountain guide for a couple of years and haf pooled many chentelmens up many mountains I alvays vished I could play vonce a chentelman myself. Dat means to hire a guide and act like a elephant in ze high, because you know, a chentleman on a mountain iss just like a elephant on ze back stairs."



Simon Mentz writes of a similar prank to Arno Ilgner at Arapiles in 2007: "Arno didn't know me from a bar of soap, and I was keen to play the sort of dangerous weirdo that you would dread climbing with. On the way to our climb I continually told him how good I was. I led the first pitch and with every piece I placed I told him how bomber it was and then when I got above it I would flick the rope so the piece would fall out. Once all my gear had slid down the rope I threw a massive wobbler and clawed my way to the belay. I then told him how easy the pitch was. He led through to the top, and I proceeded to fall off at every opportunity. When I topped out I told him that I thought the climb was too easy and that we should do something harder. We didn't climb together after that." Apparently, Arno only learned it was a prank many years later.

The Games Climbers Play

A sidebar note to help interpret the acceptable steep rock climbing tools in North America in the 1920s-1930s period.

Games Climbers Play

In Games Climbers Play (Ascent, 1967), Lito Tejada-Flores interprets climbing as a game activity, precisely because there is no necessity to climb and take risk. Rules of the game are self-imposed to make climbs more meaningful to the climber, which may or may not involve kudos from the climbing community. Tejada-Flores details the precise spectrum of various 1960s climbing games from bouldering to expeditions and writes: "The rules of all climbing games are changing constantly, becoming ever more restrictive in order to preserve the fundamental challenge that the climber is seeking from the inroads of a fast-changing technology."

In other words, the tools and techniques are fundamental to how climbers choose to play each game. In the 1920s in America, lassoing a horn then pulling up on the rope, or getting a shoulder stand from a partner were considered acceptable as they did not require any "artificial tools," except for the 'natural' rope. The rock climbing game rules progressed dramatically as pitons, carabiners, and climbing shoes became standard equipment. In the next post, we'll investigate the technological changes as well as the vanguards during the dawn of North American big wall climbing in the 1930s, but first, a few rambles...

"PERCEPTIONS" OF CLIMBING: A VARIED LENS

Like all humans, climbers are influenced by both intrinsic and extrinsic factors, a topic beyond this area of research, and recently explored in Fine Lines, a 2019 film by director Dina Khreino with well-known climbers describing their motivations. Since the days of Whymper, one extrinsic aspect of mountain climbing involves the everchanging set of public perceptions. At various periods, climbing has cyclically resonated with a broader audience, and as top climbers become household names. laymen's explanations of the challenges emerge. The precise rules of the game are generally kept close by the cognoscenti, mostly because they are too hard to explain, or overly simplified as the recent "only hands and feet" to explain the significance of the Dawn Wall in the New York Times in 2015 (what, no butt chimneying?—maybe "only arms and legs" better to include the use of elbows and knees in the off-width cracks). Modern free climbing, for example, has a broad and evolved set of rules celebrating practice and pre-placed safety gear. The precise consensus "rules" are not always easy to discern when reading published accounts, especially in the early eras. Climbs outside the normal boundaries have often been ignored and then forgotten by other climbers, though deeper research sometimes reveals keys to understanding the significance of ensuing developments of tools and techniques.

Regarding established "rules", there is rarely full agreement on any facet in any era. In the extreme case, it will be interesting to see how Olympic climbing evolves, especially considering the odd combined-game scoring in 2020. In layman's explanations of various climbing game challenges, sometimes further particulars are spelled out and made understood, such as the distinction between climbing Everest with O's or without, or that El Capitan free climbing is possible because of the previous

installation and removal of hammered hardware (pitons), creating small fingerholds where there were none before, followed by explanations of climbing "clean", sometimes glossing over the additional bolted and fixed anchors that enable the placement of only natural gear for subsequent ascents.⁴⁸ The games have always been gear-dependent: in the 1970s and 1980s, the idea of bringing a power drill into the mountains (e.g. Maestri on Cerro Torre) was abhorrent to most climbers, but today has become common practice, thanks to more efficient technology. Today's main bigwall game is free-climbing no matter how much aid initially required, resulting in exceptional performances on the vertical.

Each game also incorporates numbers, a secondary game due to the subjective nature of defining challenges; indeed, the grade aspect has been at the root of countless debates. Personally, I try to avoid superlatives such as best, fastest, hardest, biggest, etc., as these terms are always temporary, and as a researcher, you are forced to compare climbs of different eras. rather than consider them in context (and of course, climbs not personally climbed, though in my case I have some experience in many areas included in this research). Likewise, I will leave the numbers and history of grading systems to others, as this is a really complex topic, and without fully understanding each era's regional and unique set of rules and tools, the numbers are meaningless.

With all that being said for context, we will next consider the rapidly changing rock climbing tools and standards in North America in the 1920s and 1930s, as they become more aligned with those already well-established in the Eastern Alps.

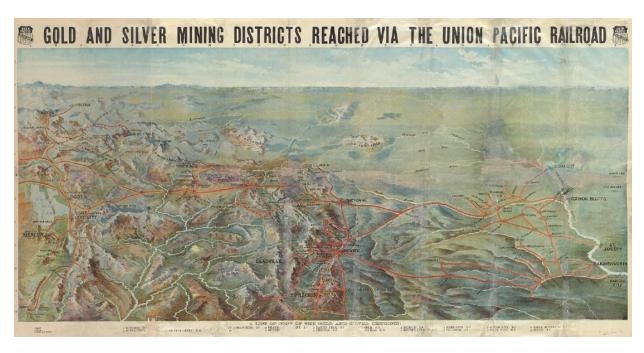
"Climbing gives me the opportunity to fulfill my dreams...it is something that is selffulfilling. People just have to look at my climbs, then they will know who I am."

—David Lama, when asked, "How would you like people to think of you?" (2013)

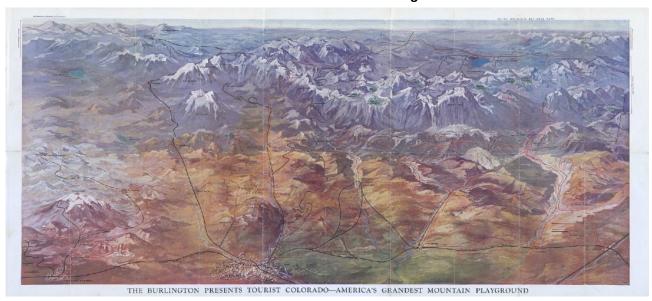
Author's notes on accepted "rules" in 1980s: In the 1980s, among my fellow 'game activity' members pursuing long rock climbs, ground-up was the only acceptable method of climbing, as it was all considered practice for future onsight masterpieces. Minimum impact also became a prime directive with the boom of innovative clean gear (complete racks of cams of all sizes were first more frequently gathered in the 1980s). For a bigwall like El Cap, you collected all the supplies to spend extended time on the wall and limited yourself in a number of ways: the use of a drill (minimally on first ascents, never except for emergency on repeat ascents), the size of the rack, the amount of "fixing" (installing ropes part way up the wall), and perhaps most central to motivation, the amount of perishables you brought, which required efficient systems so as not to run out of food, water, smokes, booze, or whatever critical supply you brought from the base. "In-a-day" push routes had to be done on calendar days, from midnight to midnight (one of the dumbest self-imposed rule ever). In general, the goal was simple: get to the top of a big rock wall. You can go slow in safe places like Yosemite, but in the mountains, you have to go fast. The first ascent game was the elegance of the "line" you were creating—the path that others might follow. Doing the most hairball stuff was also part of the game, though the line between reckless and bold was very fuzzy.

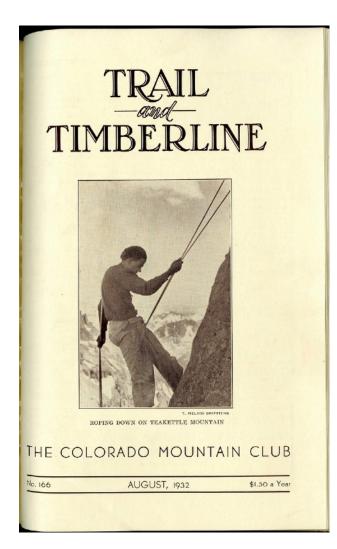
⁴⁸ footnote: Regarding "clean" and "natural" definitions in the modern era, clean gear refers to any of the modern tools that can be placed and removed without significant damage to the rock, no hammer is needed. Hammered tools such as pitons and mashheads are not "clean" but can be natural, i.e. a natural crack (bolts are neither "clean" nor "natural"). Aid techniques will be covered in later chapters.

PART 2-NEW DEVELOPMENTS IN THE UNITED STATES

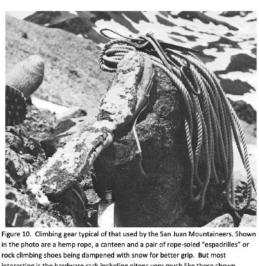


1896 map. Like elsewhere in the industrial world, mining initially drove improved access into the more remote mountain ranges.





The Colorado Mountain Club's Trail and Timberline periodical, with Dwight Lavender roping down on cover.



interesting is the hardware rack including pitons very much like those shown elsewhere in this paper. Photo cropped from the original by T. M. Griffiths in San Juan Country (1984, p. 209).

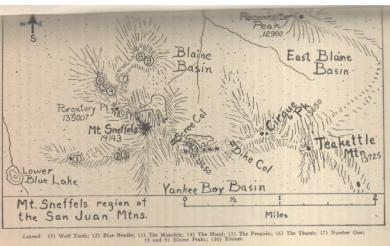


Figure 3. Aiguilles on the northwest side of Mt. Sneffels; (L - R) The Hand, The Penguin and The Thumb. Photo by T. M. Griffiths in W. M. Bueler's The Roof of the Rockies (1974, p. 152).

Aiguilles climbed in the 1930s in the USA (Lee Dexter: "Some Artifacts Created and Used by the San Juan Mountaineers, Leland R. Dexter, Ph.D.).



ers of the San Juan Mountaineers, Dwight Lavender (left), Cheste rest Greenfield (right). Photo most likely taken by Mel Griffiths in San Juan Price (center) and Forre Country (1984, p. 213).

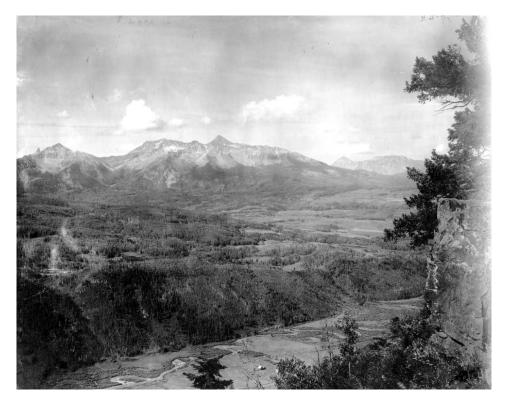


USA adoption of pitons 1920s-1939--Part A: Colorado (Albert Ellingwood and Dwight Lavender)

Author Note: The period between 1920-1939 is the early development of improved rope and belay systems in North America—first in Colorado, then spreading north into Wyoming, then the East Coasters joining in the fun. By the late 1920s a boom of cutting edge big rock walls were climbed. and by the 1930s were of global standards. This part is a journey into the early technical climbs in Colorado and Wyoming in the 1920s, where the systematic use of rope and pitons began in the USA (it is also where I also learned the basics of camping and roped mountaineering starting in 1974 at the Telluride Mountaineering School, run by Dave Farny).

Early Days

The transition from mountain climbing with an occasional rope to systematically protected rock climbing in North America matured in the 1930s, but the progression took decades. It is impossible to say when the "first pitons" were used for rock climbing, as parallel developments from surveyors and miners who had been using various hardware to drill and peg rock while ascending rocky cliffs for over a century. The ascent of Lizard Head in 1920 was one of the first acknowledged use of pitons on a technical route by rock climbers. The method of its ascent became well known in the 1920s despite club reports overlooking any mention of hardware in that era.



The San Juans are the locale of some of the earliest long rock climbs in the United States.

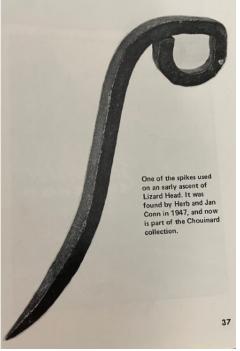
Lizard Head, 1920

In terms of the variety of rocks to climb, America's west is one of the most diverse in the world. After all the known tallest Colorado peaks (the "14ers") had been climbed by 1916, climbers started eyeing the multitude of sheer stony summits in the Rockies. Many of the early forays followed obvious fault systems on steep walls and ridges of rock, sometimes involving long sections of loose and unconsolidated rock. Protection systems on these early mountainous rock-climbing routes were rudimentary; safe havens were often only the occasional "belay pin" -a lasso over a horn or spike of rock as an anchor at rope-length intervals (also known as "anchor rocks"). Using repetitive aid to ascend these routes would be folly and the safest methods required bold skills in deft free-climbing,

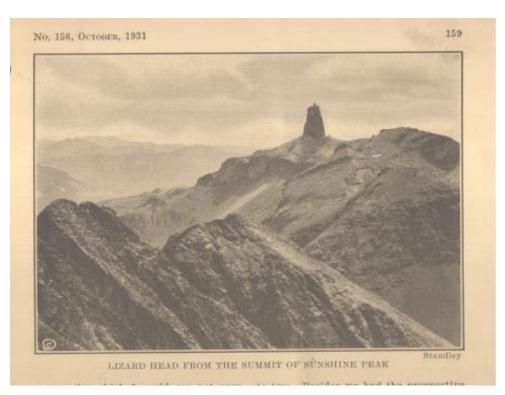


Post-1911 USGS photo of Lizard Head Peak, after a significant portion of the mountain crumbled. The barely balanced finger spire on the right side was still present on the early ascents. Albert Ellingwood and Barton Hoag made the first ascent in 1920. Rope and anchor systems in North America were advancing in the 1920s in Colorado and Wyoming.





Left: Eighty-pound packs for a multi-day expedition to the summit of Lizard Head (Outing Magazine, 1921). Right: Rolled spikes common in early American mountain climbs (Off Belay, 1972). The pitons used on Lizard Head in 1920 were likely wrought iron, but Americans soon discovered the benefit of lighter and harder steel pitons for technical rock climbing.



often gymnastically balancing on crumbly holds with a well-calculated distribution of weight, to overcome the most dangerous sections.⁴⁹ Sometimes casually referred to as "third class" without a rope, or "fourth class" with rope, these sections of rock in the mountains can be dangerous and still take lives every year.

Even though the first ascent involved three points of aid, the climb of Lizard Head in 1920 remained one of the hardest routes in

this regard for decades to come, later becoming known as a "fifth class" route. Lizard Head sits atop a beautiful San Juan pass in the Colorado Rockies near Telluride and was once thought to be a rocky volcanic plug, like Devils Tower/Bear Lodge in Wyoming, but rather is composed of a highly crumbly volcanic tuff, a remnant chunk of a 30 million-year-old ash flow. It was once a much bigger mass in the shape of a giant lizard's head, but one night in 1911, the entire main summit comprising

⁴⁹ Lighter weight steel pitons were probably not more common in Colorado until the mid-1920s, and the few who had them were quiet about their possession and their use ("I heard people comment on their use in the same tone of voice as though saying 'He cheats at cards'." - Miriam O'Brien, 1957). And just as in Europe more than three decades before, built steel trails were starting to be installed on popular summits - such as the 1915-1925 process of improving access to the summit of Long's Peak, a popular 14er due to its proximity to Denver. "During the 1925 summer season, Ranger Jack Moomaw and two workers installed two separate sections of steel cable on the North Face of Longs Peak, one 160 feet long, the other 30 feet in length, using single jack-hammers and short rock drills to create holes in the granite rock for the eye-bolts through which the cable was threaded." (People and Nature on the Mountaintop, Alexander, 2010). Climbers were still seeking the middle path leading to safer and more efficient methods. From T&T, 1926: The cable was installed by Jack C. Moomaw, Glenn Walker and Harry Simpson. The work consumed about a week. The first thing was to drill holes in the smooth granite face for eighteen eye bolts of one-inch iron. This work was difficult as the men had to be tied with ropes and work under unusual obstacles. They had no protection whatever from the storms that frequently sweep across the peak. The cable was placed at an elevation of about 13.500 feet or some 700 feet below the summit of Longs Peak. After the holes were drilled, the eye bolts were set in cement and 200 feet of 5-inch galvanized iron cable was then carried up to the north side of the peak. This cable weighed 125 pounds. It is capable of holding a weight of five tons so that there is a large factor of safety."

Author note1: These developments in the evolution of climbing in the San Juans mirror my own initial steps in climbing five decades later. I first learned ropework in 1974, at the Telluride Mountaineering School at age 14. We usually would have a stiff 120-foot Goldline nylon rope (3/8"), and sometimes also a 45m "perlon" (11mm), the European core-sheath ropes starting to become available in the USA. For some peaks (and even some of the 14ers like the Mt. Wilson to El Diente traverse), we would often bring the shorter Goldline as safety, but generally never need it as we scrambled up and down steep rock walls. We always had a good supply of shoulder-length webbing slings that could be quickly untied and tied to natural anchors, and of course, a few carabiners as well. In addition to our 14er peak bagging goals, we often carried hardware on our week-long treks in the San Juans and San Miguels, sometimes finding steep clean lines of rock on the smaller peaks, which we would climb with a very light rack of clean gear-stoppers and hexes, brought for an occasional supplement to an anchor, but more importantly insurance in case of retreat on committing climbs with unknown. Routes like Wham Ridge were basically simul-solos with an occasional proper belay. Routes, where a rope and a few bits of hardware (and an ideal weather window) were also objectives.



The San Juans in Colorado where I climbed all the 14ers, and first learned how to navigate big rock walls with friends and ropes. The red line is the continental divide.

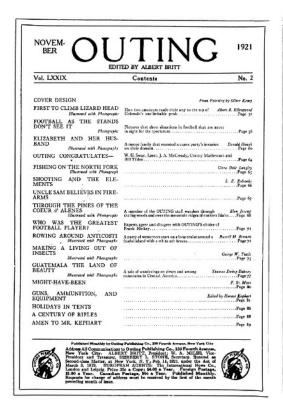
Author Note 2: I climbed the Lizard Head in 1991 with Chuck Kroger; modern gear like camming devices were mostly useless in the crumbly volcanic rock, the main protection stemming up a shattered 5.8 corner were a few old dubious spikes hammered in long ago, backed up by marginal stoppers. Even though by the time of our ascent, the route had been climbed probably hundreds of times, still, a few hundred pounds of rocks and small boulders tumbled on our way to the summit. I was able to hide around the corner while belaying Chuck on the first pitch, but Chuck had to dodge some sizable rocks in the semihanging braced belay in the corner of the second pitch. Climbing this kind of rock is a mixture of ensuring one's ability to downclimb each move, in the back of one's mind always a plan for a potentially terrifying escape route, as more often than not, the route finding is complex and finding oneself off-route and committed on unclimbable terrain is always a possibility (as well as not injuring or killing your belayer with falling rock). I started climbing in the San Juans in the 1970s, but even though we were leading 5.9s and some 5.10s on Ophir Wall, climbs like Lizard Head (5.8) were much more feared then.

"millions of tons" of rock collapsed, rocking the residents of the mining town of Ophir 10km distant. Only a smaller 100m spire of rock was left standing, and when this remnant was ascended only nine years later in 1920, it began its long tenure as the most difficult Colorado summit climb. ⁵⁰

In 1921, Albert Ellingwood, who led the first ascent, published "First to Climb Lizardhead" in Outing Magazine, a popular adventure periodical of the day (1882-1923), and with a wider readership than alpine club journals. By this time, there were dozens of

hiking and mountain clubs around the country publishing trip reports and other news of the mountains, and the concept of "rock climbing" as a distinct sub-sport of mountain climbing was growing. Motorized access to remote areas was everexpanding, and as tourism also increased, the public also became more curious about the shenanigans that climbers were achieving on the wild landscapes of America.

In Outing, Ellingwood describes using pitons as "long, thick spikes, somewhat like those

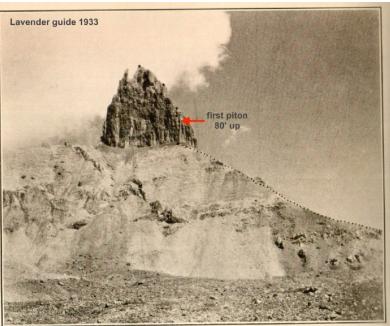




Varied "outdoor" content in Outing Magazine, and the climb of Lizard Head by Albert Ellingwood and Barton Hoag as the lead story in the November 1921 issue.

⁵⁰ Albert Ellingwood wrote of his climb of the remaining spire of Lizard Head, "A rottener mass of rock is inconceivable. Each movement that I made sent down a rattling shower of stones. Needless to say, every hand and foothold had to be tested with the utmost thoroughness. Most of the enticing small holds, crumbled at a touch and large masses of the loosely compacted pebbles would topple dangerously at a slight pull." Ellingwood describes three points of aid and a shoulder stand with Hoag. ('Millions of tons' of rock reported in the Mancos Times-Tribune, Dec. 29, 1911, noting also the (re)naming of Lizard Head in 1875 by the Hayden survey.)





Old photographs of Lizard Head--the finger spire (left) collapsed sometime in the 1930s.

used for steps on telegraph poles" and indeed, he used them in the same manner while ascending Lizard Head, "driving one in the crack about waist-high to step upon", and others as an additional hand- or foothold to overcome steep sections (i.e. not as a belay or as lead protection). They had initially planned the climb with a larger team, so luckily brought a 100-foot rope (80-foot ropes were standard for mountain climbs at the time), as safe, natural belays were few and far between and Ellingwood and Barton Hoag needed every inch of the longer rope to avert a suicide simul-climb.

All about ropework

Prior to lightweight "artificial" anchoring technology (i.e strong steel vs. heavy wrought iron spike), climbers on these early steep rock routes were always on the lookout for sturdy "anchor rocks", and for the leader, the rope only provided optimistic assurance for potential escape. The rope's main purpose, therefore, was to lash onto natural flakes of rock to secure oneself and

then safeguard the second, minimizing the overall risk to the team as efficiently as possible. Though Ellingwood reputably introduced rope techniques to Colorado from prior experience in England and





The "loose pinnacle" as photographed by the second ascent team (T&T), and one of Ellingwood's photos in the November 1921 issue of Outing.



The Denver CMC members of Ellingwood's 1916 expedition climbed Kit Carson Peak, Crestone Peak, and Crestone Needle. The team comprised of Ellingwood and Eleanor Bartlett, Marie and Joseph Deutchbein (siblings), Eleanor Davis, Sarah Davis, Bee Rogers, and Rea Ellingwood. From Eleanor Bartlett's Photo Scrapbook, Colorado Mountain Club Collection, AAC Library. In 1920, little was known of this expedition, but by 1922, the CMC had five regional groups sharing information: Denver, Pikes Peak, Fort Collins, Boulder, and Estes Park.



1920, 1924, and 1928 ads for basketball shoes with rubber soles, which became known as the "modern sneaker", were adopted by early American climbers for rock climbing as early as 1919. Rope-soled shoes and felt-soled shoes, which required a breaking-in period, were also used and preferable for wet rock. Many climbers still used nailed boots for all their climbing, however.

western Europe ⁵¹ (the rudimentary techniques outlined in George Abraham's *Complete Mountaineer* in recommend "paying out" the rope to the leader while anchored on a "belay pin"), it's more probable that Colorado climbers, many who grew up learning rope and knot skills about the same time they learned to walk, became highly competent rope managers and continually evolved and improved their own unique rope, belay, and anchor systems for the steep rock climbing in the Rockies. There may have also been a

few strong carabiners arriving from Europe and used by climbers in the early 1920s, but they would have only been a luxury to the climbers of the day, as strong ropes, lashing cords, and harness rings (strong steel rings for bridles, etc.) would have been standard equipment to facilitate safe and versatile rope management, a pre-requisite for implementing more advanced tools for lightweight alpine ascents of the wild vertical. ⁵²

⁵¹ Albert Ellingwood (1888-1934) was the first Coloradoan to receive a Rhodes scholarship and studied at Oxford from 1910-1913. (Source: Wendy Hall oral history interview with Robert Ellingwood, Albert's son 2006). He climbed in England and traveled to the French and Swiss Alps, but did not travel to Axis countries, where advanced piton and rope techniques had developed. I posed this question to Stewart Green, who writes (2022): "That is a really good question about Albert Ellingwood and early piton use in the United States. As far as I know, there is no direct mention from Ellingwood or his contemporaries about bringing pitons back from Europe to the United States after his Rhodes stint was over. He did learn rope techniques in the Lake District in England and did some ascents in the Alps, but you're right, there is no mention that he went to the Dolomites which would have been a place where pitons were used. I don't think that pitons similar to modern ones were even made until about 1910 so it's unlikely that Ellingwood would have brought any similar pitons to those back home. As far as the Garden of the Gods, I don't think he placed pitons on any of his routes in that era. He climbed Ellingwood Chimney on Keyhole Rock and apparently did not place pitons on it since there aren't any cracks. Harvey Carter later added a couple of drilled Army angles. Lance, his famous route on the West Face of Grey Rock, was probably not protected with pitons. Other routes he did were easy ridge climbs and scrambles on the main formations. When I take people on the ridge between Grey Rock's two summits and then downclimbing the south face, I tell them that we are climbing it as Albert Ellingwood did in 1914 by not placing any gear and running the rope over knobs and grooves for protection and tying off boulders and horns for belay anchors. From what I've read in early articles by and about Ellingwood and talking with Bob Ormes in the 1980s before he died, I think that Ellingwood used what was considered proper technique in that age--using running belays where the rope was placed in grooves or cracks to protect the leader or tying a piece of rope around a rock spike or tree and having the rope run through it or clipping it to a steel carabiner. Ormes told me that he thought that Albert brought back a rope and several carabiners from Europe. I don't remember that Bob ever mentioned that Ellingwood had also brought pitons back to Colorado. So, yes, I think you are on the right track. There is no information that indicates Ellingwood brought pitons from Europe to Colorado." Ellingwood references his climbs as "the kind of climbing in which a special technique is an essential factor" (Ellingwood, AAJ 1930).

⁵² Ropework would be second nature to those growing up in the small towns of Colorado (such as Cripple Creek where Ellingwood spent the first few years of his life) and especially on the Western Slope, the vast region west of the Continental Divide in Colorado comprising a third of the state's land area. The Western Slope was still quite isolated from the main populated areas on the Front Range on the east side of the divide (and still the entire area is represented by only one member of congress compared to seven for the east side of the divide). In the 19th century, the U.S. Army and one-sided treaties had dispossessed most of the First Peoples who were once there, and the rich lands for farming, livestock, and logging became the primary means of American settlers in this remote region in the 1920s, and still run on true "horse" power. With horses as the primary motive force, the expert use of ropes, both long lengths and short straps (in some areas, called "piggin' strings"), to secure and contain large loads would have been second nature. Having lived on the Western Slope for many years myself, one cannot imagine anyone seeking expertise in ropework—handling dynamic loads, makeshift anchors, knots, etc.—would have ever needed the information from abroad (think: roping a bull vs. catching a falling climber).

Nearing Summit of Windom (14,084)



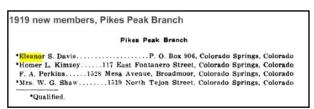


Summit of Sunlight Peak (14,853 Ft.)

From Trail and Timberline report of the 1920 Colorado Mountain Club outing which began with 84 campers, and included ascents of Windom and Sunlight peak. This trip was also a favorite of the Telluride Mountaineering school in the 1970s, which begins at the Needleton, once a populated station along the Durango Silverton stage road but subsequently abandoned with the advent of the Durango & Silverton Narrow Gauge Railroad (opened 1882). Needleton then became a standard watering stop for the steam trains and offered primo access to the San Juans (n.b. the train would stop at any of the access canyons upon request). These ranges became popular with those interested in "serious rock climbing,"

Clubs consolidate, information shared.

Ellingwood's original 'tribe' was a group of active climbers based in Colorado Springs known as Cheyenne Mountain Club, which included Eleanor Davis, a leading mountaineer/rock climber and faculty at the prestigious Colorado College, and Manly Ormes, the librarian and father of Robert Ormes (a leading climber of the 1930s), but soon expanded when its two dozen or so members merged with the Denverbased Colorado Mountain Club (CMC) to became the Pikes Peak Branch in 1919. Initially, the Pikes Peak Branch and the main Denver branch were quite distinct groups but that was soon to change. For example, in 1920, Carl Blaurock climbed what he believed to be the "last" of the 14ers. Crestone Needle, but Ellingwood had already climbed to that summit with Eleanor Davis four years prior (Ellingwood's first Trail and Timberline reports only appear in 1925). But after the merging of the clubs, the best of the regional climbers were to join and push new standards of long steep rock routes in America.



Eleanor Davis joined the CMC in 1919, but had been an active climber based out of Colorado Springs for many years prior.

14ers (summits 14,000 feet+ above sea level)

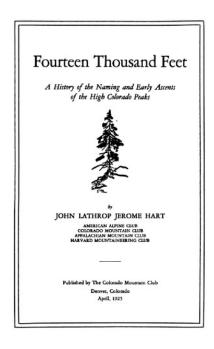
Just as the arbitrary collection of 8000m summits became a bugaboo five decades later, summiting the 14ers became the main game afoot for the primarily Denver-based CMC members: to bag all of Colorado's tallest peaks. In the 1920s; the list of "14er" summits was being continually refined as surveys became more accurate and climbers reached consensus on the definitions of distinct summits. For most of the Colorado 14ers, a rope is superfluous after managing any steep permanent snowfields, but several 14ers require balance climbing skills on steep rock, with a safety rope deemed prudent in places (see author note above). The journals noted news of friendly rivalries of first to complete them all, or in the shortest time, etc. —in the 1920s, many of these contenders were fulltime professionals working in Denver and could only find limited time to explore Colorado's mountain ranges. Carl Blaurock and Bill Ervin were the 14er leaders for many vears, but Blaurock soon expanded his repertoire with more challenging rock climbs, often new and more difficult routes up the 14ers, and also on many spectacular lower-elevation Colorado summits.

feet above sea level. The 14 peaks that rise above 14,000 feet ar shown on plate 3 and are listed below. Peaks above 14,000 feet in San Juan region		
Handies Peak. Wetterhorn Peak. Wetterhorn Peak. Wilson Peak. Innamed peak near Mount Eolus. Lewart Peak. Wetterhorn Peak. Wetterhorn Peak. Wetterhorn Peak. Wetterhorn Mountain. Wetterhorn Peak. Mount Wilson. Jeounn Peak. Mount Wilson. Jeounn Peak.	14, 032 14, 050 14, 053 14, 079	East of conter of Silverton quadrangle. Southeastern part of Ourny quadrangle. Southeastern part of Ourny quadrangle. West of center of Yellurids quadrangle. Neir center of Needle Mountains quadrangle. Northwestern part of Cochetopa quadrangle. Northwestern part of Cochetopa quadrangle. Northwestern part of Sinn Orisobal quadrangle. Do. Do. Do. New York of Wood of

The official tally of 14,000'ers in the 1935 USGS survey. Note that El Diente, recorded as climbed in 1890, and measured by Dwight Lavender in 1930 as 14,200', not yet recognized as a separate peak.

Carl Blaurock (1894-1993)

As one of the most active mountaineering and climbing groups in the country, the volunteer-powered Colorado Mountain Club organized many camps, meetings, and lectures sharing information on access and the challenges for the many who dreamed of adventure in the sub-ranges of the Colorado Rockies. The CMC had launched in 1912 with 24 charter members and by 1918 had 435 dues-paying members (including Carl Blaurock), expanding to over a thousand by 1922. In April 1918 they began publishing *Trail and Timberline* as a "monthly bulletin to contain reports of events past, announcement of events to come, and such other material that may suggest itself from time to time." Blaurock and his family Irma and Ottilie were active members and contributors, leading camps (both summer and winter), participating in theatric events, and serving as a director beginning in 1921. Camps generally began with large groups heading into the mountains for up to a few



One of the first collaborative efforts of the major alpine and mountaineering clubs in the USA (1925).

weeks, with smaller teams of half-dozen or so alpinists splitting off for the big goals. routes often requiring coordinated ropework on fourth-class summits. Blaurock was a respected leader and led many first-timers to high summits, and his endurance treks were legendary: one trip with Dudley Smith, Bill Ervin, and Bob Nelson in the San Juans linked multiple ranges involving 60,000' of vertical gain over 200 miles, while "galloping" over a dozen 14ers. It was one of many successful trips (other early notable rock climbing mountaineers include Agnes Vaille, Elwyn Arps, Henry Buchtel, Steve and Jerry Hart, William and Clyde Smedley to name a few). Blaurock was a natural on steep rock and was noted in the journal as having "good sense in his acrobatic performance."

Hermann Buhl (1891-1931)53

Hermann Buhl, was born in Baden-Württemberg, Germany, and migrated to the USA in 1913, first as a student at the University of Chicago, then moving to Denver in 1917 to begin a career as an investment banker. Before he migrated at age 22, Buhl had climbed in the Swiss Alps, and in the northern limestone Alps, home to the Zugspitze and the Kaisergebirge and famous climbs like Tita Piaz's 1908 ascent of the west wall of the Totenkirchl. There are no mentions of Hermann Buhl in the German-Austrian alpine journals prior to 1913, but there are hints by people who knew and climbed with him that he had repeated several difficult piton-protected rock climbs prior to his becoming an American. Bob Godfrey writes in Climb!:



Hermann Buhl, Albert Ellingwood, and Carl Blaurock (left to right) in 1924 at Beck's Cabin on Torrey Creek, on their way into the Wind River Mountains in Wyoming. AAC Library collection.

⁵³ Note this is a different Hermann Buhl than the more famous Austrian Hermann Buhl (1924-1957), who soloed Nanga Parbat in 1953 without oxygen, and who died on Chogolisa in 1957.

"Buhl had climbed frequently in the European Alps and was a member of the Swiss Alpine Club prior to his emigration to the USA after WWI. He was familiar with the use of modern climbing equipment, including pitons, crampons, carabiners, and ice axes, as well as with the technique of rappelling and the use of rope for protection against a fall." (Climb!, Bob Godfrey and Dudley Chelton, 1977).

Hermann Buhl joined the CMC as a "qualified member" in 1919, and quickly became active in organizing winter trips and writing articles for Trail and Timberline (he was also a world-class skier and ski instructor, teaching contemporary European techniques during Colorado's early ski evolution). He married Lumena Wortman in 1920, and she also became a CMC member and an accomplished climber (their son William Godel became an international spy and deputy director for DARPA). Buhl sadly died of pneumonia after leading a winter camp in 1931, but in those twelve years with the CMC, he was a well-respected, accomplished rock climber and a valued member of teams pushing new limits of rock climbing in Colorado and Wyoming.⁵⁴



Hermann Buhl obituary, Trail and Timberline, 1932

William H. Godel built his reputation as a legendary intelligence operative. He started his career as a marine in World War II, and was later sent to Europe undercover—posing as a German veteran—to recruit foreign scientists to work with the Pentagon. Godel became one of ARPA's most influential early employees, pushing the agency into an ambitious counterinsurgency program in Southeast Asia.





William Godel, the son of Hermann and Lumena Buhl, took his stepfather's name after Lumena remarried. The Imagineers of War, (Sharon Weinberger, 2017) tells the fascinating story of early ARPA and the enigma of Godel.

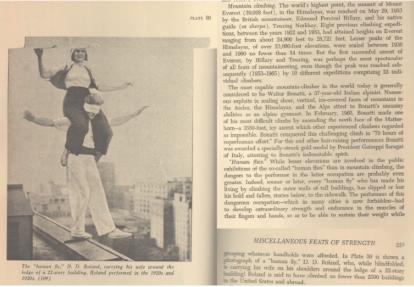
⁵⁴ Harvey Sethman writes in the 1931 Trail and Timberline: "Hermann Buhl fell victim to double pneumonia. Probably his habitual spirit of helpfulness contributed indirectly to his passing, for but a few days previously, although he was not feeling well, he was up in the hills, instructing others of the club in skiing, of which he was a master." Buhl was also the treasurer of the CMC for many years.

Daredevils and rock climbers.

In the 1920s, American daredevils were capturing worldwide fame, enhanced by images in newspapers and magazines, photography oft made possible by the latest clever and portable folding cameras: "human flys" climbing tall buildings, wire walkers like Ivy Baldwin and the Wallendas performing high wire acts, barnstormers dangling from speeding airplanes, untethered construction workers defying gravity, high-divers and polesitters seeking records in scenic locales. Many of these "daredevil" feats involved climbing skills. The major climbing clubs and organizations—the Mountaineers and Mazamas in the northwest, the Sierra Club in the west, and the American Alpine Club and the Appalachian Mountain Club in the east—were primarily interested in big mountain climbing and exploration, which involve more expeditionary expertise rather than climbing skills. Steep rock climbs were still considered more the realm of daredevils

One of the more elite yet discreet "daredevil" games (where participants

than of proper mountain climbers. 55



One of the many "daredevil" games popular in 1920s America: the "Human Fly". From The Super Athletes, David Willoughby, 1970.

sought only peer celebrity) was the art of building climbing on university campuses, which were often full of climbable Gothic architecture, a popular collegiate design style to create an atmosphere of respected antiquity. James Alexander likely first gained his skills in the art of ropeless balance climbing, known as "roof climbing", on the buildings of Princeton University in New Jersey, where he was first a student, then as a professor at the Institute of Advanced Studies (and a peer of Albert Einstein).

⁵⁵ As an example of how steep rock climbing was considered, Lloyd Shaw writes in the Nov. 1922 Trail and Timberline: "The adventurer on the trail of fame, the "go-getter," hunts out the danger and never minimizes it in the telling. He makes of the high peaks things to conquer, scalps to hang on his belt. He seeks records and feats of acrobatic daring, and he finds them a-plenty. He seeks the most difficult route, and he deserves praise for his daring; but the mountains thru him are misunderstood again. Places of dread, and terror, and danger he makes them. Even the scientist, the so-called "naturalist" soon finds that his audience prefers thrills to truth, hair-breadth escapes to simple straightforward going. He may feel the pulse of nature beat, but does anyone care to hear about it? They want the little adventures made into breath-holding dangers. They don't want a simple cruiser in the wood; they desire a pirate, with knife In teeth, and red bandana, and burning fuses hanging from his queued fore-locks, and so the poor naturalist dons the garb and makes himself as terrible as he can. If his chipmunks must be bears, he will make them so. And he who has loved the hills deserts them, and for his own glory makes his beloved mountains things of dread, or terror, and of danger."

Long's Peak, 1922

In 1922, using his balance roof climbing skills, Alexander climbed a 200m steep rock face on the east side of Long's Peak in basketball shoes, ropeless and using only an ice axe used to chop steps to the base, then continued to the summit. The route later became known as Alexander's

Chimney; it was his first long "rock climb", and perhaps the hardest free climb in North America at the time (though no doubt less acrobatic than some of the building climbs at Princeton). Alexander returned a few days later and climbed it again with resident ranger Jack Moomaw, who wrote a harrowing tale of the experience.

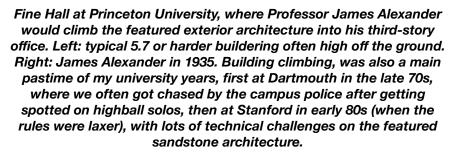
Princeton "Prof" First White Man to Scale Chasm Lake Side of Long's Peak





-Photo Copyright by Humphreys Airplane Co.
THE EAST FACE OF LONGS PEAK, SHOWING ROUTE FOLLOWED







Buildering at Dartmouth and Berkeley.



In 1922, Blaurock published in Trail and Timberline, "A Trip Up the Northeast Face of Long's Peak", documenting the Colorado Mountain Club's ascent of the route only a few days later, with a large team of seven climbers and only a single 70foot rope (21m) which had to be passed between groups. Hermann Buhl did most of the leading while the others often used tension from the rope to overcome the steep bits. Buhl's wife Lumina and her brother Herbert were also part of the team. It's here we can see the lights coming on—instead of the typical team of half dozen or more climbers to storm summits. Blaurock concludes that three people would be an ideal size for such climbs. It was here also that Buhl demonstrated the European custom of switching to lightweight rope-soled shoes for rock climbs (Blaurock also

brought a pair and led some steep sections), rather than the heavy boots with Swiss edging nails considered standard at the time. It's unlikely they had any pitons to safeguard the route, but in reading the report (e.g. "Found Buhl sitting on ice with his feet braced against two small projections on the side of the chimney"), it's clear that the security of an artificial anchor, of the lighter steel kind familiar to Buhl but not yet established in Colorado, would have been welcome.

It was in this period that the concept of a piton as a spike for an extra foothold or handhold transitioned into an anchoring safety device and as a potential tool for a retreat for the more daring climbs, though on Alexander's Chimney, the commitment was not extreme, as retreat down its ledgey corner system would involve belayed and sometimes easier ropeless downclimbing,



Ormes's 1952 guide showing Alexanders and Stettner routes, the first rock climbing forays up the northeast face of Long's Peak. Many of the routes on Long's Peak when first done were considered the "hardest climb" in Colorado, and this trend continued in 1960 with the first ascent of the east face's bigwall.

with several manageable rappels off natural anchors. Yet an artificial tool as an emergency anchor on committing routes would have started looking attractive to many early rock climbers if it was well designed, relatively lightweight, and fit for purpose. Longer ropes for climbs of this caliber was also noted as critical, as it provides more options for safe travel (70' was too short!, they discovered on Longs).

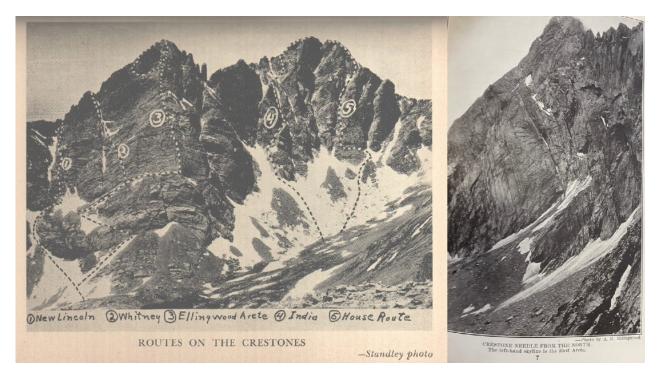
Later in the decade, Alexander's Chimney became a popular climbing route, recommended to those who enjoy "unusual and difficult ways of ascending mountains", fueling further interest in spires and steep summits previously considered "impossible", a term very much in the vocabulary of climbers of the time.

Crestone Needle, 1925

The Ellingwood Arete on Crestone Needle, climbed in 1925, is a visionary line involving acrobatic and exposed free climbing (then called "fine balance technique"), where a fall was not an option, but the lead made more palatable with the ability to rope off a natural belay pin, sometimes called a "hitch". Ellingwood describes starting up the Eastern Arete of the Crestone Needle with Eleanor Davis, Marion Warner, and Stephen Hart in 1925:

"There were pessimistic doubts expressed as to the last five hundred feet, where the precipice seemed to attain verticality, and near the top of which a huge boss of well polished rock was certain to force us into an enormous overhang from which we could discern no avenue of escape. But we set forth."

Ellingwood notes that the team used (natural) anchors that could "hold a thousand pounds", but notes that some belays involved precarious stances and careful maneuvering of the team, sometimes requiring members to brace in precarious positions while the rope was used elsewhere. Committing routes of this caliber boomed in the 1920s, and it is easy to imagine how carrying a piton or two would have lessened the fear when heading into more dangerous unknown territory, where sudden storms were also a possibility.



The 1920s began an era of climbing ever more elegant rock-climbing "lines" up the mountains in North America. The posthumously named Ellingwood Arete, first climbed in 1925 by Ellingwood and Eleanor Davis, Marion Warner, and Stephen Hart, is one of the most elegant early examples of heading into the committing unknown territory, with possibilities of getting stuck high and dry on a precarious stance with no natural anchor, an improbable downclimb, and impossible rock above.

"Fine balance climbing" (free climbing) was more widely practiced on the more accessible cliffs by the rock climbers of the day— it's unclear what local experimentation with artificial anchors as safety in the early 1920s, though it would be typical for climbers to practice new methods on local crags prior to lugging any extra gear into the mountains.⁵⁶



Wind River range, Wyoming. Approaching Fremont Glacier (1924). Courtesy AAC Library.

Commitment increases

Prior to the Crestone Needle ascent, In 1923, Albert Ellingwood and Eleanor Davis repeated the Owens Spalding route on the Grand Teton with Davis, with Davis leading the rock climbing sections in "sneakers", further opening the Coloradan eyes to what was possible. Ellingwood, Davis, Blaurock, Buhl, and others continued to climb new technical routes in Colorado and Wyoming; many were bold forays up elegant new lines on long rock routes, managed with coordinated ropework by the team.

Wind Rivers

In the 1920s, access to the Wind Rivers in Wyoming was improving, and climbers started pouring into this wild and scenic range.⁵⁷ In 1920, Arthur Tate writes in Appalachia: "Fremont Peak, 13, 720 feet, was ascended in 1842 by John C. Frémont the great explorer but practically all the other prominent peaks are unclimbed, including Gannett Peak, 13,875 feet, the highest peak in the range." Tate climbed Gannett two years later and published his reports in Appalachia, noting the pleasant camping conditions:

⁵⁶ Footnote: Climbers were also starting to explore the limits of free climbing on more accessible crags such as The Third Flatiron, Garden of the Gods, Cheyenne Canyon, Poudre Canyon (Grey Rock), Estes Park and South Platte. The route up the Third Flatiron, for example, had first been ascended by Earl and Floyd Millard in 1906 (with no ropes or gear), but by 1931, guides had fully equipped the route with bolted and pitoned belays. There were probably also many "experiments" not recognized as a "mountain club ascent", such as the Setting Hen/Chimney Rock near Fort Collins, which the "Loveland watchmaker had drill climbed the west wall with a dozen or so rods of 3/4 inch steel set in 10 inch holes" (Ormes, 1952). It reminds me of the epoxied slings that still dangled from the Columbia Boulder in Yosemite in the 1980s, it looked interesting, but no one considered it a climb (not to mention the fact that several of the slings had weathered and ripped). Basketball shoes were also being adopted for steep rock climbs. Regarding the definition of 14ers, Ellingwood writes in the 1930AAJ: "By the end of 1916, there was no virgin 14,000 peak in Colorado, and serious rock climbing was getting under way." Blaurock is currently credited with climbing all the currently defined 14ers in 1923.

⁵⁷ Yet was by no means easy to get to the Wind River range, involving 95 miles travel from the nearest railroad by carriage or motorcar over mostly semi-arid high desert, then two hard days journey on foot to get the outskirts of the Winds. In 1924, Arthur Bent writes in Appalachia: "The Colorado Rockies have become well known to many in the last few years, owing to their convenient accessibility by rail and auto. So, too, with the Glacier Park and the Montana Rockies. But the Wind River Range finds itself in the center of a large semi-desert area, not easily reached by the average tourist because so far from the usual routes of travel. This condition is improving, however, and the next few years will probably see more climbing in that splendid range, where the peaks that have been climbed can be counted on the fingers of two hands."



Albert Ellingwood, Hermann and Lumena Buhl, and Carl Blaurock on their trip to the Wind Rivers (1924). Courtesy AAC Library.



Left: Approaching Helen Glacier. Right: Albert Ellingwood, Lumena Buhl, Carl Blaurock and Hermann Buhl on the summit of Gannett Peak (1924). Courtesy AAC Library.

"There are superb wild flowers everywhere and much wild life, including the mountain sheep, many elk, moose and bear. Certain of the streams afford excellent fishing—trout and grayling. The higher regions are truly alpine, with rugged peaks, extensive glaciers, many waterfalls and an extraordinary number of mountain lakes."

Something for everyone, in other words. To the rock climbers, new "impossible" climbs became more visible on the high-quality granite batholiths, on rock more solid than the crushed uplift of other Rockies ranges. In the 1920s, the Wind River range (the "Winds") became a prime "destination" for climbers, with updates of climbs in the range published internationally. In 1924, Ellingwood, Carl Blaurock, Hermann and Lumena Buhl spent ten days reconnoitering trip in the northern Winds, climbing several new routes, and noting, "excellent rock for climbing (as is true for the whole region)". Here we see more prompts for better systems to more efficiently reach summits, by climbing the steep rock buttresses rather than the obvious lines of weakness in the snow and ice gulleys. On the north wall of Freemont, while the Buhls and Blaurock were chopping over 100 steps in an ice gulley to the side, Ellingwood "tackled the rocks of the pinnacle directly. Tried three different routes and got hung up the last time on an eight foot ledge which for perhaps 15 minutes I could neither make it up or down." Shortly after, the rest of the team reached the ridge above and started back to assist with a rope rescue, but Ellingwood was able to downclimb "the ticklish crack I had ascended" and found a feasible line to the top, recommending it as "easier and quicker" than the ice route, and continued taking direct rock climbing lines to the summit rather than ducking into the more enclosed ice chimneys off to the sides.



The area where Albert Ellingwood, Hermann and Lumena Buhl, and Carl Blaurock spent much of their time on their first trip to the Winds. "Tower 1 on Mt. Helen in the Alpenglow " (AAC, 2015)

Ellingwood marks this time as the start of "a new chapter" in the history of mountaineering, and the first ascents in the Winds "set the ball rolling". In the years that followed, routes up the steep rock walls in the Winds were being eyed with a more expansive view of the "possible", new tools and techniques were adopted, and by the end of the 1920s, climbers were ascending new routes in the Winds fully equipped with pitons, carabiners, and safer running belays for bold and difficult rock climbing.

BIBLOGRAPHY

"The Adventures of Captain Bonneville," by Washington Irving. "The Rocky Mountain Region of Wyoming and Idaho," by James Eccles,

in Alpine Journal, Vol. IX, p. 241 et seq.
"Report of the Exploring Expedition to the Rocky Mountains in the Year 1842, and to Oregon and North California in the Years 1843-44," by Capt. J. C. Fremont, Washington, Gales & Seaton, 1845, p. 61 et seq.

'Wyoming's Yosemite," by A. C. Tate in Travel Magazine Sept. 1920, Vol. XXXV No. 5, p. 30 et seq.

"Exploring Glaciers in the Wind River Mountains," by H. N. Kleiber, in American Forestry, Vol. 29, No. 353, p. 288 et seq.

"The Wind River Mountains of Wyoming," by Arthur C. Tate, in Appalachia, Vol. XV, No. 11, 1922, p. 156 et seq.

"A First Ascent in the Wind River Range," by Arthur Bent, in Appalachia, Vol. XV, No. IV, 1924, p. 468 et seq.

"A Trip to the Wind River and Teton Ranges," by Carl Blaurock, in Trail and Timberline, No. 83, August, 1925.

"An Excursion into the Wind River Range of Wyoming," by Gaylord C. Hall, in Appalachia, Vol. XVII, No. 2, 1928, p. 108 et seq.

See also Appalachia, Vol. XVI, No. 1, 1924, under "Alpina", p. 97, for first ascents.

"Gebirgsfahrten in den Windriver-Bergen im Wyoming" by Herman Bühl in Der Alpenfreund, Munich, Feb. 1926, p. 85 et seq.

By the 1930s, the Winds had become a "destination" rock climbing area.

(Studiey Willian, Bight: The Great Fall of the Volumenton (Copyright, S. R. Hayans). What the camera has to report regarding the natural wonders of Montana and Wyoming

From the Mountains of Montana to the Tetons of Wyoming Strolls Through a Region Whose Scenic Beauties Are Menaced by the Mailed Fist of Commercialis By LeRoy Jeffers. F. R. G. S.

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UP AN UNCLIMBED MOUNTAIN

Dodging Glaciers in the First Ascent of Mount Moran, 12,100 Feet, and Descent in Darkness

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Enhancement Proceedings

New York Times, April 11, 1920 documenting the first ascent of Mount Moran

Scientific American, April 3, 1920 on the ascents in the Tetons, by LeRoy Jeffers.







Left: Mt. Moran. Right: Carl Blaurock photo of Albert Ellingwood on the northeast ridge of Mt. Moran (new variant). (AAC Collection).

Tetons

At the same time the limits of possibilities were being explored in the Wind Rivers, interest in the more alpine challenges of the Tetons was also on the rise. Just as the east wall on Long's Peak was later first ascended by a daring soloist, in 1919 LeRoy Jeffers climbed the "unclimbable" Mt. Moran, bold solo up the northeast ridge followed by an epic nighttime descent. LeRoy Jeffers writes in the New York Times articles that prior seekers for a route up Mount Moran "had finally concluded that staples must be driven into its cliffs before it could be conquered."

The climb became national news, and just as on Longs Peak in Colorado, subsequent teams soon repeated the routes with safer techniques involving ropes and equipment, including an ascent by Ellingwood and Blaurock on their way back from the Winds. The more obvious and direct routes to the summits which involved steep rock climbing increased in appeal. Ellingwood lays down the challenges of new routes on the Grand Teton in "The Call of the Rockies" in Appalachia in 1926: "It will take master at rock work to find a new route on the big west wall above the upper saddle, to ascend the north ridge to the lofty summit, or to overcome the cliffs and gendarmes on the southeast arete." And indeed in the years that followed, these routes and others would all be climbed with "special technique" to summits that thwarted initial mountaineering attempts.

Prior to the ascent of the last unclimbed Teton, Mt. Owen, in 1930 by Teton locals Fritiof Fyxell & Phil Smith, with Robert Underhill & Kenneth Henderson visiting from the East Coast, Underhill and Henderson



The leader maneuvers into stemming position, protected by a piton driven high on the right wall.



A delicate shift of weight permits the leader to reach holds in the chimney to the left of the huge chockstone.



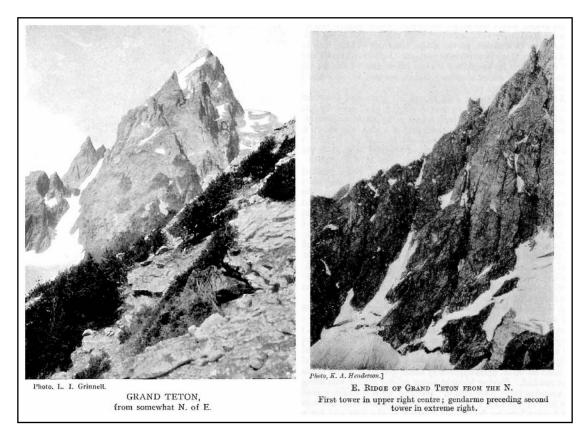
The last moves in the exit chimney lead to the belay spot. In the background is the base of the 100-foot chimney.

It was here that two points of aid with pitons was reported in the AAJ to overcome this section on the North Ridge of the Grand Teton (now rated 5.7). Willi Unsoeld on a 1953 free ascent. Photos: Fifty Classic Climbs of North America (Steve Roper & Allen Steck, 1979).

had climbed the East Ridge of the Grand Teton in 1929—a 4000-foot rock climb and landmark route now rated 5.7 with a recommended rack of a dozen cams and nuts. No mention of pitons is reported in their published account of the climb, even though the authors had been noting the benefits and use of pitons for several years. It is Fryxell who first describes the use of pitons in the Tetons in the 1932 American Alpine Journal, of his 1931 ascent with Underhill of the North Ridge of the Grand

Teton, where the pitons were used for aid, a technique which soon became known as "tension climbing". This is not the first use of pitons in Colorado and Wyoming, but an important published acknowledgment as the direct aid of pitons was integral to their ascent, important information for others who dreamed of repeating the route. The use of these aid pitons was noted as "justified" in the journal.⁵⁸

⁵⁸ Fryxell's description of first acknowledged use of pitons in the 1932 American Alpine Journal on the north wall of Grand Teton: "But the difficulties of this chimney were immediately forgotten in the face of the real crisis which now confronted us, for that portion of the chimney immediately above us consisted of a vertical rise of at least fifteen feet, beyond which it was blocked by a chockstone so huge that it extended well out over our heads." After describing a failed shoulder stand, Fryxell continues, "We retreated to our snow-corner in the chimney, and here, after a council of war, decided that now if ever the use of pitons was justified. Returning to the right wall, Underhill drove in a first piton at the limit of his reach, and, from my shoulders, drove a second one perhaps three feet higher. A ring was snapped into each, and by means of these rings we roped ourselves to the pitons. It was now Underhill's turn to launch an offensive. He mounted to my shoulders and, using the upper ring, attempted to climb to the chockstone. But though of far greater strength than I and having a longer reach, he, too, found the absence of holds an insuperable difficulty and after a strenuous try was forced back to my shoulders for a rest. A second effort likewise ended in failure and was again followed by a shoulder-rest, but on the third he solved the problem. (In calm retrospect, after the lapse of several months, Underhill still admits that this was the hardest pitch he ever climbed.)



The 1929 East Ridge of Grand Teton takes the left skyline. Alpine Journal 1930.

"Special Technique"

Many stories have been written of historic climbs as being first done without pitons, which, to a modern climber, infers they were essentially dragging a rope and soloing exposed, tricky, possibly icy 5.7 or 5.8 climbing with death fall potential. If the reference to artificial anchors was not reported, then some readers have assumed that no pitons were used. Not so: there are examples where a 1920s climb is described in minute detail, but with no reference to safety anchors which in later years were reported or known. The assumption of having a few safety pitons for certain climbs was recognized by the cognoscenti, the relatively small group of climbers within each of the national centers who were focused on steep rock balance climbing (very bold solo climbing on the Sierra granite peaks was also developing at a fast pace, e.g. Normal Clyde). When it came to tension (aid) climbing techniques being developed

and practiced in the 1930s, only then did it become the norm to count the pitons and provide a "rack" of equipment needed to repeat the climb. But there is no doubt that during the explosion of new rock climbs in the Rockies between 1925-1930, pitons had been used for anchors and for "roping down" the new testpieces of the day, many of which have faded to obscurity.

In "Technical Climbing in the Mountains of Colorado and Wyoming", Ellingwood's debut article in the prestigious American Alpine Journal's second issue (1930), he provides a list of technical climbs requiring "special technique", among them Lizard Head, new routes in the San Juan Needle Mountains, ascents in the Wind Rivers and "new and interesting routes" in the Tetons, including "several of the lower pinnacles." He makes no mention of any hardware, but the implied use of pitons for roping down becomes clearer on more

MOUNTAIN CRAFT. Edited by Geoffrey Winthrop Young. Charles Scribner's Sons, New York.

This notable work differs both in matter and in tone from preceding manuals on mountaineering. It is, as a whole, a work of collaboration, yet so preponderant is the part of the one who modestly announces himself as the "editor," that it is to his chapters that the reviewer is inclined to devote his full attention. It is a magistral work, speaking with the authority of pastmastership touching every form of the craft: rock, snow and ice climbing. As regards tone, these chapters might almost pass for a course of university lectures on the various topics; in addition to those just mentioned, "management and leadership," "guided and guideless climbing," "climbing in combination," "corrective method," and "reconnoitring." The preface declares the book to be not only for those who climb mountains, but for anyone who likes to walk, read or think about them. It is to be feared that readers of these latter categories (unless perchance of British training) would find themselves as little edified as quite unprepared auditors listening to the lecture of an expert in any of the recognized departments of science. For climbers of even a limited degree of experience it cannot fail to be stimulating, and will surely prove so to those who already hope one day to climb.

Mr. Young has witnessed at close range all the more recent developments of mountaineering, particularly in the British Isles and in the Alps, the former field to no small extent the nursery of the latest generations of English alpinists. Rock-climbing, in particular, has been fostered and highly developed in the difficult cliffs, crags and chimneys of England, Scotland and Skye. The disadvantages of this schooling, as well as its benefits, when the scene is transferred to the longer and more taxing climbs of the high Alps, is duly exphasized. With this warning, the would-be climber is recommended to get his early practice there.

The author is an ardent defender of guideless climbing (to him the only worthy goal of a climber's ambition), for self-discipline, attainment of capacity for leadership, and for the keenest enjoyment of the sport; but his pages offer no encouragement to premature or rash indulgence, or to "solitary" climbing. His ideal "rope" would contain climbers of equal capacity taking turns in leading. Therefore he discusses every aspect, psychological as well as physical, of the training for participation; and hence, as a corollary, for the headship of a party. The emphasis laid upon these aspects of the craft differentiate this manual, so far as we recall, from all its predecessors in the field. A study of the mentality of each one's companions and of the guide, if guide there be, is recommended as perhaps essential to the day's success. For the physical requisites of successful team-work are the mastery of balance, under all conditions that may arise, and the acquisition of "rhythm," without which celerity, grace and even safety are forfeited. One cannot but feel, from the degree to which these points and others like them are stressed, that "efficiency" of a Taylorian rigor is Mr.

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Young's ideal. All this portion of the work is so elaborately treated that any brief review becomes inadequate. Doubtless some of the author's limited number of peers would differ in opinion on matters of detail.

The high value of the work is still enhanced by the chapters furnished by collaborators, each an authority on the field discussed. Captain Farrar, lately president of the Alpine Club, discusses "Equipment." Special information for would-be visitors to distant regions for exploration and high ascents—the Arctic, Norway, the Himalaya, the Tropics, the Caucasus and the Canadian Rockies, as well as the nearer Pyrenees—is furnished by men of world-wide reputation for success in these several fields. "Mountain Photography" and "Mountaineering on Ski" are not omitted.

The beautiful half-tones that adorn the book deserve a word of mention, as well as the author's very individual method in appending the accompanying legends. Although photographs they are presented as types and generic, rather than as specific localities: "Rock and Ice," "Snow Ways," "Mountain Architecture" or "The Alps," "The Himalaya."

CHARLES E. FAY.

MOUNTAINEERING ART. By Harold Raeburn, Stokes, 1920. \$3.75.

This is an interesting and valuable addition to the library of any climber and it contains many useful hints on rock and snow craft. The author has spent many years in the Alps, the Caucasus, and the British hills, and his conclusion is that "It may be taken as an axiom in mountain craft, that the greater the rock-face, or mountain, the greater the certainty that a way up it exists."

First in the technicalities of mountaineering, Raeburn places the art of balance. Without this inborn faculty one can hardly hope to attain brilliance as a climber. The number of climbers for a roped party is discussed, and it is shown that there is strong opinion that two competent mountaineers can accomplish more than a larger number on a difficult climb. We have found this to be the opinion of the most fearless and ingenious guides. The guide must know his man, however.

From the scarcity of professional guides on this continent, the usual initiation to the mountains has been with some mountaineering organization where opportunity is offered to climb with experienced amateurs. But much of the resourcefulness of a competent mountaineer must be gained from his own initiative. While solitary exploration and climbing are not to be recommended to another, the brevity of vacations and the difficulty of finding suitable companions at the time are often temptations to follow in the footsteps of John Muir, who perhaps was the most ardent and fearless mountaineer that America has known.

British and Swiss rock and snow climbing are discussed at length and imaginary climbs are given to illustrate the problems one may encounter. When viewed from a distance the steepness of a climb is

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often very deceptive. The angle of a rock face should not exceed 70° in order to be climbable. Even the route up to the Matterhorn, which is one of the steepest in the Alps, is only 30°. Extensive slopes of snow or ice are said not to exist at a greater angle than 55°. The climber is cautioned to avoid the mountain tops and ridges when his ice-axe buzzes from electrical conditions. Lightning is not to be trifled with on the heights, but it is believed there is little risk from it on slopes and glaciers that are not steep. In the absence of water the author has eaten much snow in small quantities without any of the reputed ill results. This has often been the experience of other climbers and, like the foolish notion that ordinary mountain altitude is dangerous to health, it may be destined to lose its harmfulness even as a suggestion.

In the chapter on equipment the ordinary custom of wearing heavy boots with wide welts is condemned and a medium weight shoe without any projecting soles is strongly recommended for greater ease of ascent and choice of footholds. The author's experience with different forms of glasses, whether monocular or binocular, is that they are not of sufficient value in determining the route of ascent to warrant carrying them.

In the strenuous life of today, one's mental and physical health demands out-door exercise of interesting variety. Nothing can be better than cross country and hill walking, which is the best training for the mountain climber. We eagerly await the day when convenient airplane service will enable the climber to spend a frequent week end, and far longer vacation than is now possible, amid the life-giving air of the mountains.

LE ROY JEFFERS.

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technical backcountry climbs in the San Juans climbed in the later 1920s. ⁵⁹

Ellingwood also warns those not familiar with the new tools and techniques about embarking on the new wave of climbs: "Of course, climbers in the Finch school, who dismiss all rock-work as nothing but acrobatics, will be disappointed." It is unclear what the "Finch school" actually represented, as George Finch (see Australia section) was an all around alpinist who also used pitons.

"Special technique" in reference to both rock climbing skills and equipment appears elsewhere in early journals, the term presumably substituted so as not to ruffle feathers of senior mountaineers not interested in such climbs and who considered protected lead climbing technique with artificial anchors as a bane to the spirit of climbing (but on the whole, US writers expressed less pious opposition than the British old guard). In his article "Reflections on Guideless Climbing" (1930 AAJ), Noel Odell infers the specialized technique goes well beyond the "ultragymnastic" ability of the participants Indeed, the ability of anyone to create a secure anchor in precarious places absent of any natural belay pins was perhaps the most significant driver of guideless climbing, as fewer climbers required the services of a guide to keep them safe on the wild vertical.60

Lavender writes in the May, 1932 Trail and Timberline on "correct rock technique": "What we must learn is to handle a rope; that a piton is superior to a spike, and is not used to stand on." He makes the case for the successful cragsman to be properly equipped for the "world of aiguilles" ("breaking away from the idea that a peak must be fourteen thousand feet before it is worth our merit") with good rope (and pitons) and specifically references: "Since 1920 a few excellent summits have succumbed to the climber (among these are Lizard Head, Pigeon, Peck, Coxcomb, Lindbergh Peak and others)," routes on which pitoncraft was the norm by 1932. He also mentions Vermillion Peak by the southwest arete, and Mount Wilson by the west arete as among the most difficult climbs in 1931. Other climbers of this period include Gordon Williams, Carleton Long, Martha Bloom, Dr. C. Clarke, Miss P. Bouck, H Briggs, F. Greenfield (TK). It's hard not to mention other adventures, like Mel Griffiths descent into the Black Canyon in 1931, which would have required expert rope rigging work in the descent. The story of Wham Ridge is also a good one—a route once considered improbable and referenced as a futuristic route that became the classic of the range, with consistent fifth-class climbing, steepening at the top (we sometimes would solo that one at the Telluride Mountaineering School).

60 J. Monroe Thorington is much more clear on the details of "special technique": "On July 2 Cromwell and North made a determined but unsuccessful attempt on Mt. Confederation. The route was undoubtedly the correct one, a tremendous slanting gallery being traversed from W. to E. across the southern face, and bringing them to the skyline at 9500 ft. There they were turned back by a succession of broken towers, which will require more time, much rope and special technique if they are to be overcome. We were unprepared for long siege tactics. As it is, several pitons now grace this ridge." (AJ 48). We also see clear references in the Scottish Mountaineering Club Journal, who were a bit less squeamish about accepting pitons as a mountaineering tool. Ian Campbell in 1934: "The account of climbing in the Cherryhinton Chalk Pits describes rather an unusual variation of mountaineering. This type of climbing apparently demands a special technique, for the article concludes with the sentence: 'The domestic poker with a sharp end has been used as a piton, but the chalk was found deficient in holding power and the poker in rigidity." And in 1937 J. Bell, editor of the Scottish Mountaineering Club Journal, on Climbs of Coire Ardiar: "These features should, however, enhance the attractiveness of pioneering in this region, because judicious route-finding and the necessity to master a special technique and to maintain a clear avenue of retreat without the necessity of roping down, for which indeed there are few belays available, are essential to both success and safety." By the 1930s, in contrast, the plain-speaking Americans were calling a spade a spade and a piton a piton. Duncan Critchley writes: "The Schist of Coire Ärdair (Creag Meagaidh) is notoriously hard to protect compared with the rhvolite of N Wales and the Lake District. Even now, pitons are widely used here."

Enter the designers

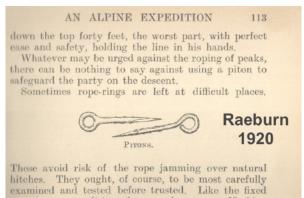
To recap, we've looked at some of the new standards of rock climbs of the 1920s where a solid anchor placed in a crack would have made the climb more possible, efficient, and less nerve-wracking. We know the climbers of the day were familiar with pitons, and how they helped make famous climbs like Lizard Head possible. And we can conjecture that undocumented pitons were appearing on the more technical climbs in this period from both inferred and explicit primary resources. What was not yet fully developed in the mid-1920s was a versatile standard tool that was light enough to be carried long distances into the mountains and on steep routes, provide trustworthy security, and most importantly, be available to climbers. Enter the designers.

Although there was some filtering of efficient hardware and rope systems from Eastern Europe to Colorado and Wyoming, information flow was probably very limited until the borders of the Central Alliance countries became more fluid in the mid-1920s. Buhl had migrated from Germany in 1913, a time when pitons were becoming common in his climbing areas, but of varied designs and probably still few of the proven Fiechtl designs (see Volume 1). In the later 1920s, more East Coast climbers were traveling and climbing piton-protected testpieces in the Eastern Alps, and there was increased migration to America adding to the knowledge base, but in the meantime, Americans started making their own hardware designs.

The first American piton designs were no doubt informed from a Scottish climbing instructional, *Mountaineering Art*, by Harold Raeburn (1920), a more compact textbook than the rambling tombs published by Abraham (1908) and Young (1920). Although Young was the first to publish on the need for an "indirect belay" to help absorb forces in a lead fall, Raeburn's text is arguably a

more clear and direct explanation of techniques becoming more universal at the time, including specific details on the design and use of pitons (whereas Young devotes four pages to dismiss "pegs" as rarely justifiable). Raeburn's book was sold widely in America and was reviewed by LeRoy Jeffers in 1921 *Appalachia*, who noted it as "an interesting and valuable addition to the library of any climber." As Raeburn notes, pitons were acceptable for "roping down", yet of course would also be useful to create a belay in places optimal for safety (i.e., before difficult sections).

In the 1920s, the USA led the world in steel products, and climbers benefited from higher-grade heat-treatable steels more readily available to small-scale crafters (in Europe, pitons were mostly mass-produced by this time from a low-carbon "soft" steel). The simple rolled-eye design shown below, made from round stock was likely the most common design in the 1920s. As pitons were initially only accepted for "roping down", they were integrated with forged or welded steel rings to enable easier pulling of the doubled rope—the rings were commonly



Raeburn's 1920 depiction of pitons are similar to the ones illustrated by Claude Wilson in 1893, and probably typical of most early (pre-1930) climbing pitons outside of Eastern Europe. Note Raeburn's complete support for pitons as an anchor for the descent. This 1920 book was recommended and reviewed in American journals.

available and designed to withstand high loads of a pulling harness for horses (1.25" horse harness rings were recommended for pitons). The idea of using a forge punch to create a stronger closed eye was not yet standard practice in the USA (next chapter). It's unknown when climbing hammers were adopted, though a

hammer of some sort would have been a carried tool on horse-pack trips into the backcountry (i.e, the Wind River range) to install tent structures and other needs.



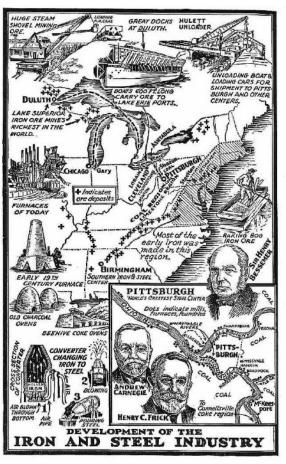
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In the 1920s, the American steel industry became the most advanced in the world.



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Forging Rings in the Farm Blacksmith Shop

by: Pete Cecil from issue: 40-4

How-To & Plans

Blacksmithing • Forging

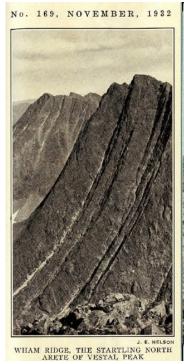
Fabricating steel rings is a common task in my small farm blacksmith shop. They are often used on tie-rings for my customer's barns, chain latches on gates, neck yoke rings, etc. It's simple enough to create a ring over the horn of the anvil or with the use of a bending fork, however, if you want to create multiple rings of the same diameter it's worthwhile to build a hardy bending jig.

one method of creating strong steel rings, a common item in the 1920s. From SmallFarmerJournal.com

"Unlimited possibilities"

One could say the first "open source" climbing hardware designers in the United States were Dwight Lavender, who, along with Mel Griffiths, published a series of articles in Trail and Timberline specifying materials and design of Colorado's state-of-the-art tools for the vertical. Whereas in most circles, climbers who were starting to use pitons on the harder rock climbs were discreet about their use, Lavender was straightforward about the need for hardware.⁶¹

In The San Juan Mountaineers' Climber's Guide to Southwestern Colorado (1933), perhaps the first guidebook in North America to recommend the new tools, Dwight Lavender writes, "There have been several climbs made that require the use of pitons and karabiners, and there are unlimited possibilities for many more ascents as difficult."





One of the "unlimited possibilities" in the 1930s, the Wham Ridge on Vestal in the San Juans. Although the North Arete did not get climbed until the 1940s, it was highlighted in several Trail and Timberlines as a stunning line (image left from 1932). Climbing this route one really feels the experience of being on a large rock wall, even though the angle is less than vertical.

⁶¹ Pitons were noted both for safety and for aid. For example, in Lavender's description for Pilot Knob: "The first climb on the Colorado Mountain Club outing for 1932 was that of Pilot Knob (13,750 ft.). Messrs. Charles Kendrick, Scott, Dave Lavender, Giesecke, and the writer (leader) established a new route up the final cliff on the west face just around from the north end of the peak. This upper cliff is only a little over 200 feet high, but the last 40 feet, necessitated the use of a piton."

Dwight Lavender (1911-1934)

Dwight Lavender was born in Telluride, Colorado, the heart of the San Juans, and during his teenage summers, he and his older brother David worked on a ranch just west of Telluride with their stepfather, Ed Lavender, and they spent most of their free time in the backcountry, climbing and becoming the 'oracles of Southwest Colorado mountaineering'. In 1929, Dwight began his major in Geology at Stanford University in California, but returned to Telluride every summer to climb with his friends in the San Juan Mountaineers, a group of climbers based in Telluride, Montrose, and Durango. Sadly, he died from the polio virus at the young age of 23 as he began his graduate degree in geology at Stanford.

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Dwight Lavender's transcript from Stanford. Note the Foundry course in the spring of 1930.



"Older Style" steel pitons from the collections of the American Alpine Club Library, found by Lee Dexter in the Mount Sneffels area (left one on The Hand, right one on the Penguin). These were possibly the design used in Colorado in the 1920s, and crafted of various lengths. Lavender refers to these as the "Older Style", after he created a design with a separate inline hitting surface (to prevent what happened to the right one, most likely!). The captive ring facilitates easier rope pull for double rope rappels, and allows quick tie-in with a short cord. The rings are welded steel harness rings, widely available as a horse harness part (avoid cast iron rings, Lavender later warns).



Left: Lavender's San Juan Piton, found by Rusty Baille on the north face of Mt. Sneffels. Right: design illustration in the 1932 Trail and Timberline article, with the "eye-up" configuration, similar to the original Mauerhaken (wall hook) pitons (see Volume 1). Marty Karabin collection.

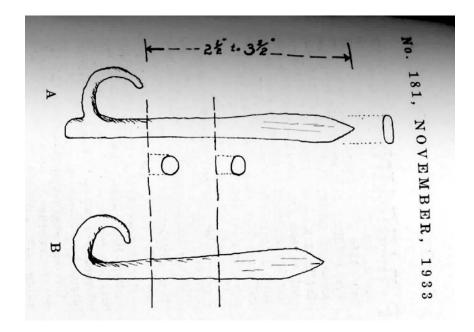
At the Stanford student foundry, Lavender created a new piton design, which he called the "San Juan Piton".62 His initial designs were "great big things", made from one-inch steel and eight inches long, but he soon improved on the "older style" pitons by the addition of hitting surface extension to provide a more directed impact when hammered into cracks. Contrary to popular lore, the closable eye was not to capture a lead rope but more to provide the versatility of adding a "rope-off ring (1 1/4 inch harness rings)", when the piton was used as a rappel anchor. It is also possible that the piton could be placed "eye-up" to act like the original "Mauerhaken" piton design, acting as a hook for the rope to be draped over, though slings and carabiners had become standard equipment by this time.

Over the years, Lavender improved its design, creating a versatile lightweight design. Early pitons were generally long and made with thick round or square shafts;

Lavender designs recognize the need for a flattened blade for thinner cracks (both horizontal and vertical—see caption below). Regarding length, he writes in Trail and Timberline (Nov. 1933): "It is seldom possible to drive a five or six-inch piton in its full length. A two-inch piton in all the way is better than a six-inch piton in half way." Modern USA-made pitons were beginning to take shape.

Lavender and Griffiths also designed new framed backpack designs, and other equipment to make backcountry trips more efficient and lightweight. Lavender was a proponent of 120-foot-long linen yacht ropes as opposed to the Italian hemp and manila, which "have been the standby for years" (1933). He notes the linen ropes were "a soft rope, easy to tie and handle, much less apt to cut on sharp rocks than wither manila or Italian hemp, and certainly more pleasant on the hands."

⁶² I forged my first pitons in this same building when was a Mechanical Engineering student in the 1980s, though mine were hardly usable (failed on the quench heat treating). Stanford provided free resources in casting, forging, and machining to students (I preferred the machine shop resources). Regarding the open-eye Lavender design, I initially imagined the material for the eye might have been split from the end, as a fire poker was a standard student forging project at Stanford, but I posed the question to Mitchell Goldman, and upon looking at close up photos of the Lavender pitons, believes the eye might have been forge-welded or perhaps even arc welded.



Lavender writes of the designs: "The sketch gives a picture of the two types. Each piton is made for a vertical crack. For horizontal cracks the shaft should be flattened normal rather than parallel to the plane of the eye. A good plan is to have half your pitons for vertical cracks, one quarter for horizontal cracks, and the last quarter made with full, round shafts." Trail and Timberline, Nov. 1933.



Early American-made closed-eye piton, with perhaps Lavender-inspired extended cylindrical hitting surface, and unique branding.



Another style of open-eye piton perhaps from 1920s-1930s period. The flattened corner would have provided better support (than the bent and rounded-eye design) for directed blows aligned with the main shaft. Geopolitically speaking, there might have been some Swiss pitons imported appearing in Colorado in the mid-1920s, but the early Swiss piton industry is unclear (pre-1930), as are their early designs.



Left: the original Dülfer method of down roping. Right: Lavender showing the variation with rope under the arm, which became standard and known as the Dülfersitz even though Dülfer's method was around the neck. Dwight Garrigues Lavender photo albums, University of Colorado Boulder collection.

Roping Down

The San Juan Mountaineers were not just developing new tools, but also sharing new techniques in their "Notes on Equipment" articles. In Lavender's photo albums, he documents various body wrap abseil methods. The original Dülfer method involved wrapping the rope around the neck to gain additional friction (left picture below). Lavender describes the "correct position for roping down" with the rope under the arm

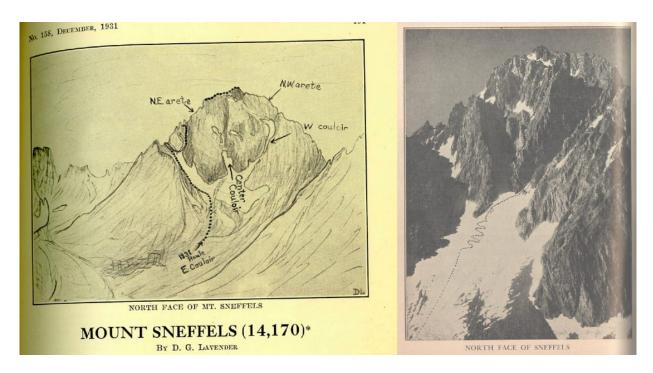
Paradons ten the story. APPROX. TENSILE STRENGTH SIZE ITALIAN HEMP LINEN YACHT 1500 lbs. 1950 lbs. 2100 lbs. 2590 lbs. The 76-inch rope is the correct size for the climber, the %-inch being a shade too small. However, it is often advisable to have an extra 100 or 120foot length of the %-inch tucked away in the rucksack for an emergency, and for use in making long rappels. Lengths

In the 1930s, 120' linen yacht ropes recommended by Lavender for rock climbers in Colorado. The cost for a 120' 7/16" linen rope was \$8.50 from the Plymouth Cordage Company in Massachusetts (Trail and Timberline, May 1933). 1800lbs. was considered the minimum strength for a climbing rope.

(image on right), a much smoother method for pure descent, and indeed, became the standard body rappel method in America for the next four decades (Dülfer's around-theneck method was better for controlled tension traversing (see Volume 1-the myth of the Dulfersitz).



Quite likely the type of woven natural fibre rope recommended by Lavender for rock climbng. (photo: Yosemite Climbing Association).



Two routes (1931 and 1932 routes) on the north face of Mount Sneffels.

Mount Sneffels

By the early 1930s, climbers nationally were starting to establish bold piton-protected climbs (next chapter), and the direct north face of Mount Sneffels, a high-altitude 14er, was one of the most committing and difficult climbs of the era, first ascended by Lavender with Gordon Williams and Mel Griffiths in 1932. Dwight's brother David later writes, "Dwight and his hulking twohundred-pound side-kick Melvin Griffiths. discovered the choice mountaineering possibilities of Blaine Basin in the western San Juans, between Telluride and Ouray." In the shadow of the stupendous north face of Mount Sneffels, they "became so enamored of the spot that with incredible toil they packed up to timber line on their backs enough material to build a shelter cabin," and pioneered two new routes on the north face in 1931 and 1932.

In Trail and Timberline, Lavender wrote of one section of the 1931 climb, "It would have been madness to attempt to go on without rope-sole shoes, pitons and karabiners" but in 1932 they returned better equipped for a more direct climb; the state-of-the-art use of pitons for lead protection were recorded in Gordon William's journal:

"I belayed the rope over a projection of rock, and Mel cautiously stepped out over the abyss. It seemed an age before he reached a ledge which would accommodate both of his feet at once. This ledge was half way along the traverse, and the belay seemed puny enough at that distance. From his position the leader drove a piton into a crack at arm's length above his head. To the piton he hung a karabiner, and in that the rope was snapped. With such additional assurance, the first part of the traverse was duplicated, except that the chimney was, if anything, a



Left: Griffiths Couloir on Mount Sneffels (Trail and Timberline, 1931). Middle: Lavender piton and San Juan Mountaineer's topographic survey marker. Lee Dexter and Scott Baxter found the piton fixed in the "eye-up" configuration on The Hand, a spire NW of Sneffels first climbed in 1932 by Griffiths, Williams, and Lavender. The SJM conducted their own surveys as the maps of the day were lacking the details for climbers of the rocky spires. Right: Dwight Lavender after his ascent of El Diente with Chester Price and Forrest Greenfield in 1930.

little more difficult than the face. Securely belayed from the summit above, I next and then Dwight reached the top. Once up, there was nothing to do but write out a record and dread the descent which we did aloud and unabashed. The record, à la paprika can, had to be wired to the scanty top, a nerve wracking procedure in itself." (1933 AAJ).

We'll finish this section on Lavender's contributions to the tools and techniques of climbing, with a passage from David Lavender, who wrote a poetic description of the new kind of lead climbing he and his brother and others were doing in the early 1930s, "why the climber employs his rope, his belays, his pitons, and karabiners":⁶³

"The rope is also a visible sign of the intense teamwork which binds a climbing party together. For instance, your leader is plastered against a sheer cliff. His face is red

with exertion; sweat glistens on his forehead. Previously he has stood on your shoulders a courte-échelle to reach a narrow crack. Into this he has jammed an elbow and knee and fought his way upward via a series of convulsions. Now he has left the crack, and his main support is the friction of his hip and hand pressed hard against the sloping stone. Cautiously he reaches out, tests a new hold for solidity, rolls his weight forward. He is anchored somewhat. He has driven a short steel spike, a piton, into a crack in the rock and fixed his rope to it with a snap-ring karabiner, so that the cord has support out on the cliff face like a belt run through a loop in a pair of trousers. If he slips, this pivotal point will limit the arc of his fall-provided you have taken up a solid belay and can hold the rope fast the instant trouble develops. You brace yourself, passing the rope around your shoulders or back, for you never in the world could stop a hurtling hundred and sixty

⁶³ Also to note, by this time, hammers were also standard equipment, Lavender used a piton hammer that was a modification of the geologist's pick: "The pick end of the hammer was shortened considerably and a thong for fastening to the hand was attached to the handle. You can make such a hammer yourself, as there is nothing like it on the market." (T&T, Nov. 1932).

pounds of man with your hands alone. And if you don't stop him and if the rope doesn't break, he will drag you off your perch; you will drag the fellow behind you, and suddenly the rope, instead of being a life line, becomes a suicide pact. Very carefully you pay it out, never letting it go slack and tangle on some projection, never pulling it so tight that it cramps the climber ahead. With this moral parachute tied about his waist, knowing that the chances of a fatal fall are reduced to a minimum, he is able to cross the ticklish spot. And when he reaches a solid stance he plays turnabout by guarding you while you come up-climbing the cliff and not the rope; weasling that way is mountaineering's prime form of cheating" One Man's West, 1956—(interesting also to note that "roping-in" was cowboy slang for cheating).

The Great German School of Climbing: The Kaisergebirge

RAND HERRON

WHOEVER goes from western countries to the Alps for a season's activity, usually thinks, first of all, of Chamonix, Zermatt, Grindelwald, perhaps of the Dauphine, or if the Eastern Alps enter his mind at all, of the Dolomites. The Austrian Alps are scarcely talked about at all.

But wherever in the Alps he is, he will always be likely to hear of some fabulous feat having been accomplished by an unknown German or Austrian who arrived there for the first time. The local guides will be mystified and probably attribute the success to luck or a crass disregard of proper cautiousness. In most cases, however, it will be found that these men have won their spurs beforehand in the Kaisergebirge, where the great majority of the best men of Germany and Austria spend their free days before they move on to greater conquests elsewhere.

Rand Herron's 1932 article in the American Alpine Journal. Herron was born in Italy of American parents in 1902, began climbing in the Swiss Alps where he had spent eight years in his youth, including an ascent of the Wellenkuppe, and climbed globally between 1925-1932, settling in New York in 1929. He died running down from the summit of the Second Pyramid in Egypt just prior to the publication of this article.

The Growing Acceptance of Pitons

The adoption of pitons in North America was similar to the reputed experience of bankruptcy: "gradual, then sudden." The "gradual" had been going on for decades; the "sudden" arrived in the early 1930s when writers and editors fully acknowledged the usefulness of pitons for great climbs and more climbers began making their own pitons, along with increased availability of pitons from Europe, both from mail-order and from traveling climbers. In addition to "old timers" like Blaurock adopting the latest tools wholeheartedly, there was also a new breed of younger climbers starting out climbing with the new tools and techniques and would push new levels of bolder and more difficult climbs in the 1930s.

> Two articles in the 1932 American Alpine Journal left no doubt about the direction of rock climbing: Max Strumia's "Old and New Helps to the Climber", highlighting all the latest piton designs from Europe, and Rand Herron's "The Great German School of Climbing: The Kaisergeairge." These were some of the first articles in English that did not nationalistically mock the so-called 'Munich school' as "dangle and whack" climbers, and clarified the exciting bold climbing that had developed in the Eastern Alps, as well as the challenges of "tension climbing" and where it was appropriate. Alberto Rand Herron was also a frequent contributor to the Italian Alpine Club and also published a comprehensive 18 page illustrated article on the history and climbs of the Wilder Kaiser in 1932 Rivista Mensile called "The Great German Gym".

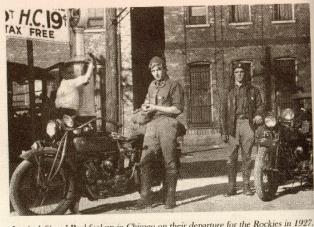
Postscript: First Mail Order Pitons from Europe

The astute historian will recognize that one of the great climbs of the 1920s, and a favorite among legendary climbing adventures that began with a long motorcycle ride, has not yet been mentioned. Joe and Paul Stettner climbed a new difficult rock climb on the east wall of Longs Peak in 1927, but the climbing community at large did not know of the ascent or the methods used until many years later, a time when pitoncraft and sources for pitons had become more common knowledge. In the 1930s, Sporthaus Schuster in Munich and Mizzi Langer in Vienna were recommended in the journals as sources for pitons, but probably few other than the Stettners knew of their availability in the 1920s. It was only in retrospect that Stettner Ledges on Longs Peak became a milestone in the shared knowledge of new

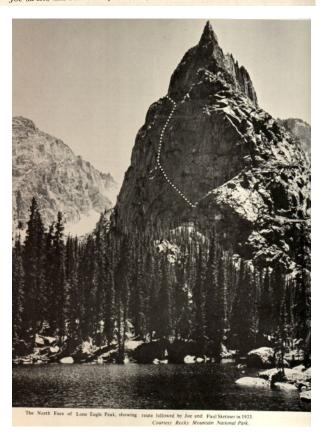
tools and techniques.64

By the time the Stettner's had climbed the north face of Lindbergh Peak (later renamed Lone Eagle Peak) in 1933, piton craft had become standard means of ascent.





Joe (at left) and Paul fuel up in Chicago on their departure for the Rockies in 1927.



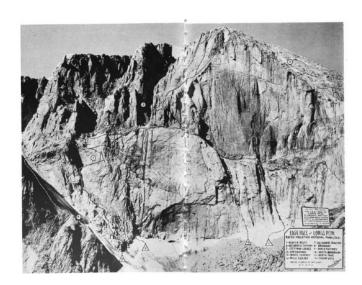
64 Here is the story relating to the Stettner's use of hardware in 1927: The two brothers had ordered equipment (mostly pitons) from Germany – almost certainly ASMü pitons, which had just begun global mail order in 1926. The pitons arrived in Chicago in early September, 1927, only a few hours before their planned departure. Two weeks later, they were in use on a difficult new climb on the east wall of Long's Peak: "We were forced to make frequent use of the pitons, as there was a scarcity of natural securings." Joe Stettner wrote of his brother's famous piton lead: "Occasionally we thought it was impossible. At one point, it was necessary to hammer in three pitons to make it possible for Paul, who was leading, to get over that part." (this section now sometimes referred to as the "piton ladder pitch"). The Stettners had a long and productive career pushing standards of climbing and developing new tools.



Wearing with pride this world map all marked with remote places, in which one - reliable as always - ASMü goods delivered: South America, Alaska, Japan and New Zealand country, across the globe there were - and there are - satisfied Schuster customers!



According to Flori Schuster, Sporthaus Schuster began exporting ASMü pitons in 1926, though few American climbers knew of the resource until the early 1930s.



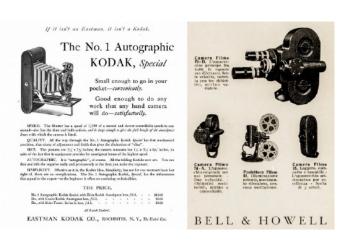
In keeping with the early nomenclature, the smaller shield south of the main east wall, home to Alexander's Chimney and the Stettner Route, could be noted as the "northeast wall".

To Be Continued...

The next chapter will focus first on the developments by the East Coast climbers, many of whom traveled to Eastern Alps once the European borders softened, starting with Lincoln and Miriam O'Brien who also became evaluators of the new tools. And as the availability of pitons increased by the mid-1930s when even shops in the more visited France were offering a fine assortment of quality pitons in their inventory (Pierre Allain). So in the 1930s, with the new tools in hand, American climbers would soon "catch up" with the standards in Europe that had been established three decades prior on routes like Campanile Basso. 1930s Routes on Mount Waddington, Shiprock, Yosemite and Zion walls, as well as new developments in the Tetons and Bugaboos, were among the hardest climbs in the world at the time, and we'll look at the developing tools and techniques of the 1930s next.

MANY THANKS

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Ed Webster, Renny Jackson,
Leland Dexter, and others.





Typical 1920 climbers' cameras—compact with interesting and innovative folding mechanisms created a boom in portable photography, enabling the capture of feats in wild places.





Climbing Ropes

Mountaineering Journal

Climbing Ropes

Will the approach of another with the second of a marker element of the post-bally that technical climbing will intered an unumally large number of control of the second of a marker of the second of a marker through the second of the seco





The American Alpine Journal, Vol. 1, Number 2, contains the following articles on climbing in the United States:

"The Wind River Range in Wyoming,"

Kenneth A. Henderson. "The Grand Teton," Kenneth A. Hender-

"Technical Climbing in the Mountains of Colorado and Wyoming," Albert Russell Ellingwood.

"The Beartooth Mountains of Montana,"

"The Beartooth Montains of Montaina, Norman Clyde.
"Seventy Years of Climbing on Longs Peak," John L. J. Hart.
"Climbing the North Face of North Palisade," Norman Clyde.
"American Rockies, Notes 1929," John

L. J. Hart.

The articles on climbing in other parts of the Americas, and even further afield, are of great interest.

This number may be obtained from Daniel Underhill, 50 Court Street, Brooklyn, New York. Price \$2.00 post-



TRAIL TIMBERLINE

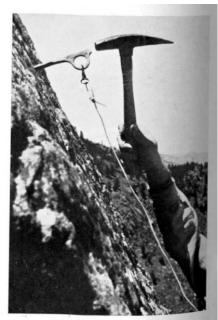
THE COLORADO MOUNTAIN CLUB Co. 18

BOULDER NUMBER
The Great Parks
Colorede Meastein Passes
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the top one has to know the character of the top.

Coxoomb is several hundred yards long and looking at it from one side it long and looking at it from one side it but from the other side looks like a hulfe ridge. Actually its greatest width so olly about lifty feet, answing down accure to walk upright. The gap was about from the down to the care to walk upright. The gap was about fifteen feet wide at the top, ansrowing down to almost four feet wide at the consideration of the care to walk upright.

Coxcomb was initially attempted without pitons but deemed infeasible, so the second attempt and eventual first ascent were equipped with rope, hammer and 'metal spikes' (Trail and Timberline, Colorado).



DRIVING THE PITON

DRIVING THE PITON

As it is generally necessary for the climber to maintain his balance with one hand, all of the work of driving the piton has to be done with the other. In the above photograph, notice the conveniences with which the climber has equipped himself for one-handed work. The rawhide thong around the wrist and attached to the hammer enables the climber to use this hand in placing the piton in the crack, and he still has the hammer readily available. The cord and harness snapt fastened to the pitton prevents it from being lost should a glancing blow of the hammer dislodge it from the crack before it has a good start.

1938 Trail and TImberline

Mt. Cannon (4,107 ft.)

formerly called *Profile Mt.*, is the long and massive ridge which enwalls the Franconia Notch on the W., and is separated from Mt. Kinsman by a narrow and exceedingly rough valley. It is of granite, with great areas of exposed ledges. Some parts are very precipitous, especially toward the S.E. The path from the Profile House is to the lower, east peak (3,898 ft.), distance 1² M., from which the main summit may be reached by a rough tramp along the ridge.

The Cannon Rock, from which the mountain derives its name, is reached by clambering down the slope to the l. for a few rods from the Mt. Cannon Path. It is a ledge of granite so balanced as to present the appearance of a cannon when seen from below. Standing upon it, the visitor looks down upon the Profile House and the narrow glen beneath, and across to the mighty ridges of Lafayette.

The visitor can next examine the Profile by making a long and difficult descent, where there is no path. It is hard to know when the Profile ledges are reached, and great caution must be exercised in approaching them.

BALD MOUNTAIN

The View from Mt. Cannon is not easily set forth, since, because there is no marked peak, and woods cover the ridge, it is difficult to get all the features in at any one point. One of its chief objects is Mt. Lafayette, which is so near, across the Notch, that it is all visible, with its great spurs and the deep White Cross Ravine. This prospect is very noble and satisfactory, and is beautified by the purple lights on Eagle Cliff, below.

The alpine spires of Garfield, Liberty, and Flume are seen on the r., extending towards the S. and flanked by some of the dark mountains of Pemigewasset. On the S. is the broad and beautiful Pemigewasset Valley, sweeping away for many leagues to points below Plymouth, studded with farms and clearings, and hemmed in by bold mountain ridges. The curving course of the river can be traced through all this long plain and by the hamlets far down the valley. This view is the great attraction of Mt. Cannon, and is of remarkable beauty and variety.

East Coast early guidebook, A Guide to the White Mountains (Sweetster, 1918)

Local Rock Climbing

BY LINCOLN O'BRIEN

Our local Boston rock climbs are surprisingly good, not only in contrast with our snow and ice work, but also with rock climbing regions in the northern and southern Appalachians. We have several kinds of rock but the better climbing seems to be consistently on that of granitic texture, with the possible exception of the Nahaut region with its Combine abule.

consistently on that of granitic texture, with the possible exception of the Nahant region with its Cambrian shale.

Our best climb within the immediate vicinity of Boston is the Hitchcock quarry at Quincy. The most difficult course runs up a one hundred and fifty foot steep rock face in a corner of the quarry, overshadowed by a tremendous overhang. The route is — for a face climb — diversified in character. The first pitch is difficult — consisting of a 75° face with small holds, and ending in a fifteen foot pendulum. The rope for this pendulum is lassoced over a large piton some ten feet up and five to the right. Above this there is about sixty feet of straightforward climbing to a large ledge which is cracked away and is going to come off some day. The third and last pitch is the most difficult and perhaps the least interesting. There is one place where one must do a r'tablissement and swing into a ledge cut into the rock in the middle of a slight overhang. Strong arm work. There used to be a nice handhold at this point before the author in a mental aberration in his younger days tried to put in a piton to make it safe for the veriest of tyros. He succeeded only in knocking out both the piton and the handhold. We suspect the interposition of divine forces. There are three or four courses similar to this in the neighboring quarries.

Rattlesnake Cliff in the Blue Hill Reservation is a granite outcropping affording shorter and more varied routes. It is excellent for beginners and for bad weather. Having an open southern exposure it is the warmest cliff near Boston and the quickest to dry after a rainfall.

Nahant is interesting, having one place where at high tide one must go across on doubled ropes in the Tyrolean fashion. The rocks in the woods behind the Roxbury Latin School; Castle Rock near Wyoming, Mass.; the Black and White Rocks in the Middlesex Fells; Robert's Quarry; Peabody Boulders; and Dogtown Common all have good short stretches.

Within a day's trip of Boston the best climbs are Storm King, [78] near West Point on the Hudson; Joe English Hill, New Boston, N. H., two hours drive from Boston; and Huntington's Ravine on Mount Washington. Then there are many more climbs of varying degree of interest.

On many of these cliffs the climber will find pitons at strategic points. Whether he (and the reader) snort with disgust or sigh with relief, I wish to justify our conduct in implanting these pitons. We have done our best to place them in positions where they would be a factor of safety but would not make the climb easier. They are not placed in the middle of pitches but at the end, or beginning, to enable the rope to be attached to them by means of a karabiner. Thus the various men on the rope cannot use the pitons to get themselves over difficult places, but can easily prevent each other from being killed or injured if they fall off. I understand that our English cousins frown on the use of pitons as unsportsmanlike, as they once frowned upon crampons. We nevertheless contest that the maintenance of our clean accident record, for rock climbing, is of more desirability than the thrill that comes from the knowledge that if one falls off one will be killed. So we continue to place pitons as a safeguards, but we never put them where they would be useful as handholds.



A HARVARD MOUNTAINEERING CLUB TO QUINCY QUARRY

[79]

Lincoln O'Brien's justification for the use of pitons on the local East Coast crags in the Harvard Mountaineering Journal, 1928

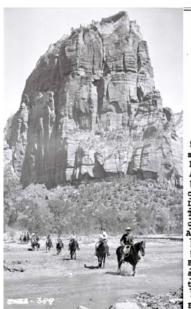
USA adoption of pitons 1920s-1939--Part B: East Coast, 1927-1933 (Miriam O'Brien)

Changing standards, 1920s

In 1920s America, thrilling tales of polar and Himalayan explorations featured in national news headlines, as more remote inhospitable parts of the globe and difficult high summits were probed, and the alpine clubs filled most of their journal pages with mountaineering objectives. Meanwhile, American rock climbers were quietly establishing their own standards first on gymnastic crags, then on 'impossible' summits, challenges that required maximum efficiency, due to weather, remoteness, or other factors. The wider range of the mostly metamorphic and igneous geology in the United States (compared to the mainly sedimentary mountain climbs of Canada) offered unimaginable possibilities/dreams on granites of every color, but also sandstone canyons and spires, varied sedimentary

walls, and tall volcanic plugs—cliffs not possible without new methods. European tools were increasingly accepted, and as pitons, carabiners, and climbing shoes became standard equipment, the 'rules' progressed dramatically.

Initially, there were strict limits on using hardware directly to gain upward progress; otherwise, as the timeless argument runs, anything can be engineered rather than 'climbed'. As a "mechanized-mountaineering" counterpoint, Angel's Landing trail in Zion, with much steel and sculpting, was completed in 1926 to a summit once thought "only an angel could land on" (Frederick Fisher, 1916). The 'sporting' aspect had to be considered as new climbing styles developed.



PHYSICAL DESCRIPTION

(DESCRIPTION AND BACKGROUND HISTORY INCLUDING CONSTRUCTION DATE(S), PHYSICAL DIMENSIONS, MATERIALS, MAJOR ALTERATIONS, EXTANT EQUIPMENT, AND IMPORTANT BUILDERS, ARCHITECTS, ENGINEERS, ETC.)

The Angels Lending Trail takes off to the south of Scout Lookout (elevation 5,477) and runs along the edge of a steep-sided sandstone ridge. The trail climbs over 300 feet in its 1/2 mile course and is neither graded nor paved. The National Park Service does not recommend this trail for unattended youngsters, those with heart or breathing problems, or those who fear heights. It is a dangerous hike at night or in inclement weather.

An erosion control stabilization program was completed on the trail by CCC personnel in March 1934. The work was supervised by Park building foreman, Walter Russch, and approved by Marry Langley, resident Landscape Architect Zion National Park. Presently, the Zion National Park Antenance Division is responsible for maintaining chiseled footholds on the trail as well as chains and railings which have been attached to the cliff.

STATEMENT OF SIGNIFICANCE: N.P.S. built hiking trail of architectural and historic significance.

/1926 Date of Alterations: 03 /18/1934 Date of Construction: Architect/Designer: T.C. Vint/W. Ruesch Historical Theme(s): Transportation History of Structure: Angels Landing Trail was constructed in 1926 following the completion of the West Rim Trail Which provided access to the trail head at Scout Lookout. Work on the trail was supervised by Walter Ruesch, acting Supt. Zion N.P. The construction of this trail which ascends the spine of a steep-sided sandstone cliff was unique and daring, as the work chiseling the initial footholds was hazardous. Angels Landing is one of the most dramatic trails ever built by the Park Service. Evaluation of Structure: Historic Theme Contributing X Non-Contributing National Register Criteria: A_B_C_ND_ (Include integrity statement) Built with native materials , associated with "N.P.S.-Rustic" architectural and constructed by Service personnel, Angels Landing Trail possesses structural integrity. All man-made improvements on trail constructed by means of hand tools. Bibliography: Woodbury, Angus, A History of Southern Utah and its National Parks, 1950. "Report on Engineering Activies Zion National Park, 1928."

The summit "only an angel could land on". World-class high-angle trail construction in Zion supervised by Walter Ruesch in 1926, no doubt inspired by the via ferratas and other mountain paths in Europe. The manufactured route goes up the left skyline. Source: NPS report on Angel's Landing Trail history (1984).

New strategies with artificial anchors

Consider how the new anchoring tools inspired new 'lines' up imposing vertical landscapes, as climbers started to emerge from the major weaknesses (chimney and corner lines) to the exposed and elegant lines up sheer faces, where natural security is less likely. Pitches on hard climbs were often short—the Whitney/Gilman route on Cannon Cliff, which famously did not use any pitons, was originally done in 1929 in 17 pitches but is now a five-pitch 5.7 (the first added piton anchor—in the form of a steel pipe—was installed two years after the first ascent). An 'artificial' anchoring tool provides more options where climbers can establish a safe place to belay, and allows climbers to extend their leads. A piton belay prior to a difficult section kept the belayer close for the next lead. Since shoulder stands were fair game, a piton anchor provided more options where such progress could be performed safely. And indeed, this is how pitons were initially used, but by the early 1930s, lead climbing as we now know it, with longer pitches and pitons and carabiners as inter-pitch anchors for the running rope became standard practice. 65

Shared information of new technology progressed, and as the piton became acceptable as an anchoring device for roping down and belays, disclosure of their use was generally only reported (sometimes

by others) if the use broke convention. The initial epicenter of both acceptance and of reliable supply of the new tools in North America was on the East Coast, first led by a group from Harvard, Yale, and other university mountain clubs, followed by the Appalachian Mountain Club, with many members who had visited Colorado and Wyoming, where striking lines up the bigger mountains were being climbed and imagined, and new safety techniques were developing. But first, a quick story on East Coast climbing history.

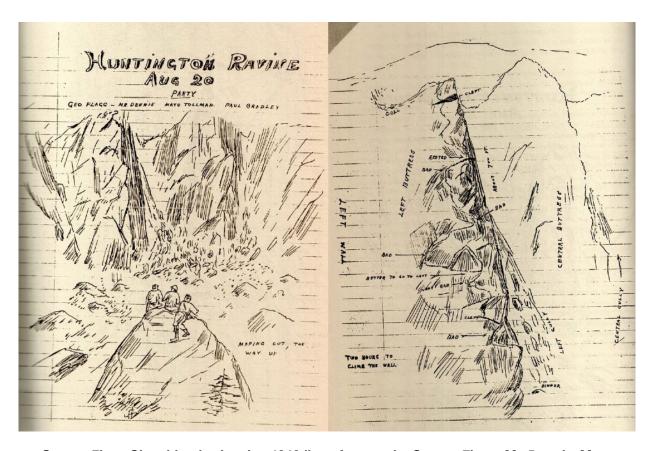
The Pinnacle, 1910 and 1928

The early history of North American mountain climbing tools and techniques has been covered previously, and as in other areas, there are sometimes isolated events "ahead of their time": some are known such as the climb of the Third Flatiron in 1906, and probably many unknown. One of the more surprising discoveries by Laura and Guy Waterman in 1984, "stumbled on by sheer luck", was in a sketchbook from George Flagg, a turn-of-the-century newspaper cartoonist with a prolific collection of sketches of the era. As historians of Northeastern climbing history, to their wonder and iov. inside one sketchbook were a number of illustrations depicting a 1910 ascent of the Pinnacle in Huntington Ravine, a feature that became a celebrated "first ascent" eighteen years later when climbers were expanding their toolkit and refining their rope skills for the big rock

⁶⁵ footnote: The idea of a 'fall factor' was not considered. Catching a short fall nearby was much less feared than a fall far from the belayer, and indeed with static ropes of the day, a short swinging fall with less kinetic energy was probably more easily caught by the belayer—the idea of dynamic belay coming to fore around this time. To clarify, a 'belay' once meant any natural or artificial anchor but now means a solid place where one climber remains to feed rope to the leader, or bring up the second; it was also known as 'security'. A 'pitch' refers to the climbing between belays. Getting a shoulder stand from a partner had been considered fair game since the mid-1800s as it did not require any 'artificial tools' except for the rope. Also considered fair game was "to get a rope over a distant target by first throwing a small cord to a lead," as described by Miriam O'Brien to describe a technique Alfred Couttet used in Chamonix. Regarding the Whitney/Gilman, Bradley Gilman (a member of the Harvard and Yale Mountaineering Clubs) and Hassler Whitney were fresh back from guideless ascents of the Grépon, Grand Charmoz, and many other alpine and rock routes around Chamonix (routes that mainly required pitons—if at all—for roping down) when they climbed their route on Cannon in 1929.

challenges (the later route is a slightly more direct and challenging line, but the idea that the "unclimbed feature" was first ascended in 1928 was debunked). "Seventy-four years is a long time to wait for glory," the Watermans write of the 1910 ascent. The challenge in Huntington Ravine is not just technical - Mount Washington is the highest peak on the East Coast and gets hit by some of the worst weather in the world, requiring efficient rope systems and teamwork to move fast. The ascent was at a level of efficient and bold roped climbing unmatched for a decade. 66





George Flagg Sketchbook, showing 1910 line of ascent by George Flagg, Mr. Dennis, Mayo Tollman and Paul Bradley. Perhaps the first climbing "topo" (certainly the first in the USA).

Courtesy Laura Waterman.

⁶⁶ Footnote: The history of northeastern United States climbing is well documented in Laura and Guy Waterman's Yankee Rock and Ice (1993).



Pinnacle Gulley (left) and Damnation (right).

Author note: Huntington Ravine is where I first learned to ice climb. One season my friend and fellow Dartmouth student Thom Engelbach and I embarked on three trips into the ravine. Our prior experience was a single-pitch toprope at a scrappy crag near campus with a thin frozen ice drip. On our first trip to Huntington's, we were being led by two more experienced upperclassmen, who had the ropes, ice screws, and gear. On the hike up, one of them punctured his leg when he fell onto his ice axe on the icy trail, and they both bailed. Thom and I continued up to check things out and ended up soloing Odell's Gulley, a moderate low-angle hard-ice route. As Thom noted, "Too cold to belay" so we made our way up there for another solo trip (we didn't have any ice pro anyway), this time the Pinnacle Gulley, considered a hard steep ice route and not often soloed. Later that season, perhaps with a bit more local ice experience, we tackled Damnation Gulley, a mostly moderate ice runnel but with a 10m steep vertical waterfall section about two-thirds the way up the 300m gulley. At the top of the waterfall, there was another party, belaying in a big snow drift. Thom got up there first and noticed that the team ahead was about to cut loose a huge ledge of snow and ice down the waterfall section, where I was still plodding my way up and pretty pumped. Thanks to Thom's imploring, they all remained motionless until I got to the snow ledge, whereupon they let loose a huge avalanche that would have most certainly taken me out on the steep bit below. Thanks Thom!



Thom Engelbach and my second ice climb, a solo of Pinnacle Gulley in Huntington Ravine, winter 1978. Big long ice axes and floppy crampons.

"Great leap forward" Northeastern USA 1928-1933.

In the Northeast USA, there was a "great leap forward" in climbing standards from 1928-1933: "by 1927 little had been done save the easiest and most obvious routes in the smaller area, The single year 1928 saw great changes" (Yankee Rock and Ice, 1993). In addition to the known ascent of The Pinnacle, the big south wall of Willard in Crawford Notch, and the sheer 300m Cannon Cliff in Franconia Notch were also climbed in 1928 (more on Cannon later).

This period coincides with progressively systematic exposés of the new hardware (sometimes called "alpine pitons") in the American mountaineering journals. An early explanation (1927) explains the piton as a "roping down" anchor, but also as means to tension traverse; this is precisely how piton-

protected climbing became more accepted several decades prior in Eastern Europe (see The Climbs of Tita Piaz, AAJ 2022). Lincoln O'Brien writes in the Impressions of Dolomite Climbing (Harvard Mountaineering Journal, June 1927): "It is fairly easy to find a place to drive in a piton—called chiodo in Italian. There is a good deal of discussion about the etiquette of using pitons. The consensus of opinion seems to be that they may be used for the rope, as a security, or in "roping down", but that their use as handholds isn't proper. Mechanical methods of climbing are used more in the Dolomites than elsewhere... When one must get across a narrow slab and cannot climb it, he can drive in a piton, thread a rope through it, and pendulum himself across on the end of this doubled rope". 67



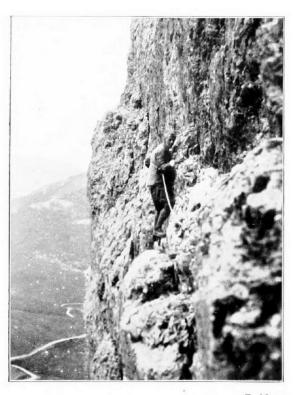


East Coast bigwalls, "unimaginable" prior to pitons. The early routes took the main lines of weaknesses, but soon bolder, more elegant paths were ascended. Left: Willard, photo by Brendan Reals. Right: View on Katahdin in 1886. AMC Library & Archives.

⁶⁷ Footnote: Lincoln O'Brien here is explaining the Dülfer self-belayed tension technique of using a separate rappel rope (vs. rope tension from a belayer—the preferred method with the availability of strong carabiners). The quote also indicates that the Northern Limestone Alps, where piton techniques had evolved even further, were still unknown to O'Brien in 1926. He also describes the technique of tyrolean between two summits, no doubt informed by the famous Guglia De Amicis in the Dolomites.

Thawing of Anglo piton acceptance (Pinnacle Club, 1920s)

Pitons were adopted to accomplish great personal goals in the 1920s and 1930s. Journal readings reveal the thawing of piton acceptance both in the UK and in the USA began with women, many of whom were learning the craft with top guides on some of the hardest rock and alpine climbs of the mid-1920s. The piton is objectively considered in terms of the experience of using them on the wild vertical and of their future potential. Progressive British journals such as the Pinnacle Club Journal publish stories of piton-protected routes without a lot of qualifying verbiage on 'moral' issues (the rules of the game). In the 1926-7 journal, Lilian Bray⁶⁸ describes a spot where she and her guide Tita Piaz were unsure of the route: "Up he went. It was so difficult that I doubted at first whether we were right; but about half way up a piton was discovered, showing that we were not making a new route. To this Piaz was able to attach the rope and ensure his safety. It was a very strenuous bit of climbing, and proved much the most difficult pitch of the climb." -Lilian Bray, Pinnacle Club.69

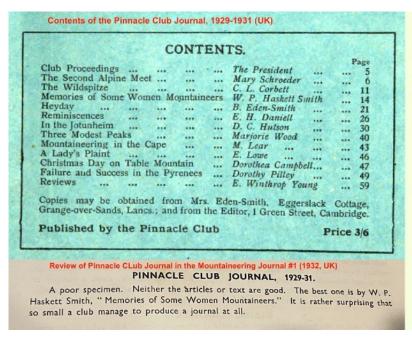


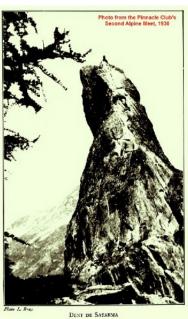
THE TRAVERSE ON THE 3D SELLA

One of Lilian Bray's climbs in the Eastern Alps.

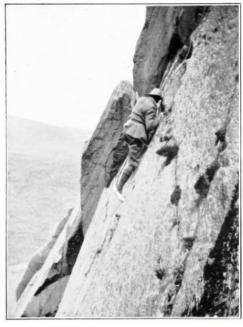
⁶⁸ Footnote: When pitons were noted in the Alpine Journal by the British hardmen, justifications would sometimes be explained with long footnotes, i.e. on NW face of Wetterhorn (1929): "This was the only 'artificial aid' used apart from the rope and was employed only as a safety device and not as an essential to the ascent. And as such was thoroughly justifiable. Our (previously dismissive comments in AJ41) remarks referred to the objectionable modern method as practised chiefly in the Eastern Alps, of driving in a series of pitons to be used as foot and hand holds in scaling overhangs otherwise impossible of access." (N.S.Finzi, AJ42) Of course, many climbers in the Eastern Alps had been using pitons in the same sporting way as the writers describe on the Wetterhorn for several decades. The same volume describes a new route on Triglav in 1929 by Jože Čop, Stane Tominšek, and Miha Potočnik where ten pitons were used on a single desperate pitch.

⁶⁹ For Lilian Bray's early climbs in the Northern Limestone Alps, see The Kaisergebirge, Alpine Journal 1925 Vol.27, p.279, and for more on early British women climbers leading at a high level, see articles in The Pinnacle Club Journals, including Dr. M. Taylor (Flight to the Mountains, 1926), Susan Harper, M. Jeffrey, Ruth Hale, Maud Joachim, Wells, Dorothy Pilley (later "Mrs. Armstrong Richards"), Marjorie Heys-Jones, Brenda Ritchie, Ursula Corning (South Tyrol-or Thereabouts in the 1934 Alpine Journal), Nea Morin (Ladies Alpine Club) and many others. A brief commentary on the representation of women alpinists is included in Volume 1 of this work, but the research on the comparable accomplishments of many women climbers of this period is incomplete.

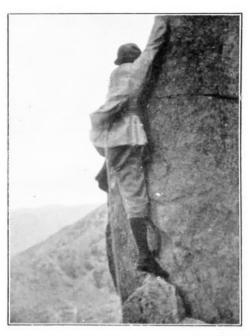




Left: Contents of the Pinnacle Club Journal, a "ladies-only" club established in 1921 in Britain. Women climbers had it tough in this era—whereas prior to WWI, women's mountaineering achievements were generally celebrated more objectively, in the 1920s-1930s, short dismissive comments about women's current and past achievements (and reviews of their stories) were common.



L. E. Bray
SUPERDIRECT ON THE MILESTONE



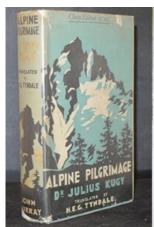
ROUNDING THE NOSE ON PILLAR

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Contrast the open acceptance of pitons in Pinnacle Journal articles with the notions of the author of the best-seller Alpine Pilgrimage (1934) Julius Kugy, considered a "father of mountaineering" and darling of the British Alpine Club (which famously did not admit women until 1974): "To fix chains and ropes and then describe them as easy and uninteresting—as in the case of the Matterhorn—is contemptible. (Kuqy) resents the paint-splash and the chains and pitons which make mountains climbable by the incompetent. He dislikes the competitive spirit, and the kind of recklessness that takes unjustifiable risks. He himself was always prudent. He climbed only with the most competent guides." (Review by Susan Harper in the Pinnacle Journal).

Traditional guided climbing in the Dolomites

In the pre-WWI era, many British climbers had a rich history of hard steep multi-pitch climbing with talented Dolomite rock guides such as Antonio Dimai (who only used pitons for security and descent), Angelo Dibona, Giovanni Siorpaes, Michele Bettega, Sepp Innerkofler, and Agostino Verzi—a few of the great steep rock climbing guides of the era.70 May and Ludwig Norman-Neruda, H.K. Corning, Edward Broome (Dolomites up to Date, AJ1907). H.Bowen (Some Dolomite Climbs, AJ1913), Emily Hornby, Maud Wundt-Walters, and Beatrice Tomasson were a few of the most accomplished British Eastern Alp climbers of this era, dating back to the 19th century. A top-level testpiece like the 1890 Schmitt route on the Fünffingerspitze was the frequent end-of-season objectiveperiodical AJ reports of fatalities on such routes grimly cautioned those who were still dreaming of that level of climbing (Norman Neruda, the 'well-known rock climber', died on the route in 1898 while climbing with his wife May and a friend).



ROCK-CLIMBING FOR WOMEN.

To the Editor of the Manchester Guardian. Sir,-The last decade has witnessed a notable acrease in the number of women who are de oted to the pursuit of rock-climbing. For some time it has been felt that women climbers required some organisation which would con-cern itself with their special interests, and serve the double purpose of promoting the in-dependent development of the climbing art amongst women and of bringing into touch with one another those who are already united by the bond of a common love for a noble

To this end a club has been formed called the Pinnaele Club. The inaugural meeting was held at Pen-y-Gwryd on March 26, and

the club already possesses 41 members.

Any women who are interested in the objects of the new club are requested to communicate with Mrs. H. M. Kelly, at 29, Fountain Street, Manchester, from whom full particulars may be obtained.—Yours, &c.,

ELEANOR WINTHHOP-YOUNG, President.

M. E. Kelly, Hon. Secretary, Pinnacle Club.

Back to the future—Alpine Pilgrimage (1934), a popular text rejecting the need for pitons in the mountains. Right: the Pinnacle Club was established in April 1921 to promote "the independent development of the climbing art amongst women".



Top Dolomite guides of the early period: Angelo Dibona (kneeling left), Guiseppe Colli (standing left with rope), and Antonio Dimai (top right with rope). Seated are the distinguished gentlemen Alpine Club climbers J.S. Phillimore and A.G. Rayner.

⁷⁰ See article by E.L. Strutt, "The Eastern Alps in the 90s", AJ 1942.

In the 1920s, however, Dolomite climbs appear to fade in popularity among the elite Alpine Club members, as the focus shifted to more alpine and guideless climbing. 71 Perhaps in terms of gender roles, as pitons became essential on the hardest Dolomite steep rock routes, the leading male climbers were less willing to be second on piton-protected climbs with a foreign guide, such as Tita Piaz and the sons of Antonio Dimai (Angelo and Giuseppe), forerunners of new climbing and guiding techniques. This left the field of challenging bold rock climbs more open to the athletic women in the UK and the USA, many of whom first learned their skills with talented Eastern Alps guides, then became leading climbers of spectacular bold free (or mostly free) climbs.⁷²



Fünffingerspitze och dess bestigningsleder:

1. Daumenschartenweg, den lättaste (första
gången använd av H. J. T. Wood, L. Bernard,
M. Barbaria och F. Fistil 1891);
2. Schmittkamin (en variant av denna, som följer kaminen i hela dess längd, är ännu svårare);
3. Diagonalriss (K. Kiene och G. Haupt 1911);
4. Südkante (V. Zanardi-Landi och G. Trevisanato 1935);
5. Südwestgrat (S. Vögle och
M. Niedermaier 1966).

For British climbers who eschewed pitons, the 1890 Schmittkamin route (#2) on the Fünffingerspitze (fivefinger spire) was a popular Dolomites trade route among Alpine Club members. Lilian Bray led her guide up the Daumenschartenweg (route #1) in 1926.

⁷¹ Footnote: A major European rock climbing trend of the 1920s was the advent of the "Sixth Grade", with its focus on the tallest big walls and usually involved some aid. Sixth-grade routes became the main rock climbing game in the headlines with incredible challenges overcome; perhaps a few of these routes were deserving of the "whack and dangle" critique, as aid and larger racks were sometimes used to compensate for lack of bold free climbing in some cases, despite the higher specified "grade" (see this post for the 1930s fixation on sixth-grade routes). In 1926 the grade was defined: "Any route or pitch that is climbed without the aid of a piton (for upward progress) is Grade V." By contrast, the lesser reported fourth and fifth 'degree' (Grade V) climbs involving bold free-climbing and minimal use of pitons were probably more influential in inspiring the adoption of piton-protected steep rock techniques in America, igniting a boom of new climbing with many leading women at the fore. See also Jack Longland's view of why Alpine Club climbers not pushing standards "Between the Wars, 1919-1939," Alpine Journal 62, Nov. 1957, 83-98.

72 Footnote: An explanation of (global) bias of marginalized groups of mountain climbers, with a focus on nationalistic themes, is well researched by Tait Keller, Apostles of the Alps, Mountain and Nation Building in Germany and Austria, 1860-1939, who writes of contemporaneous attitudes in Austria-Hungary: "Male chauvinists saw a direct connection between the mechanization of the mountain and the feminization of mountaineering." Some women found an ironic voice: Emmy Hartwich (later Eisenberg) in Die Frau in den Bergen. Eine heitere Plauderei über ernste Dinge ("The woman in the mountains. A lighthearted chat about serious things") in Mitteilungen des Deutschen und Oesterreichischen Alpenvereins 50, no. 3 (1924): 26–28, describes a percieved view that women lacked the ability to skillfully to handle a rope because "Having to wrap a stubborn rope, sometimes wet, sometimes dirty, around their body wasn't in the nature of a woman", and pokes fun at how the "female creature had to be switched on" for a man following a leader. Hartwich wryly parodies the 'stupid recklessness' that men called 'courage', an era peaking with mythic stories of climbers with bravado brashly heading into the unknown, often with glorious failures and heroically portrayed death (e.g. the many failed "attacks" on massive alpine walls, often with limited tools and techniques, that end with grim fatalities). It should also be noted that alpine club journals were not completely devoid of women's accomplishments; in 1936, a time when Olympic nationalism was at its peak, the Deutsche Alpenzeitung published "Die Frau in den Bergen" highlighting leading women of the era.



The Croda da Lago was also another aspiring route in the Italian Dolomites for visiting climbers (AJ, 1941)

Grosse Zime. The north face of this forbidding pillar, one of the most impossible looking walls in the Dolomites, has at last succumbed to the "hardware" technique that in the Eastern Alps goes under the name of rock-climbing. A number of attempts have been made but on August 10th the guides, Josef Dimai and Dibona, with 90 pitons, 50 karabiner, over 750 ft. of climbing rope and 500 ft. of small line, made an attempt which placed them fairly high up on the wall. The next day they were joined by the amateur, Emilio Comici, and the guides, Angelo Dinai and Antonio Verzi, who brought with them a large number of pitons and karabiner and over 400 ft. more rope. The combined party was again forced back and the guides, Dibona and Verzi, gave up in disgust, but nothing daunted, the remaining three set out again on August 13th and after a night spent on the wall succeeded in completing the ascent. A German paper chronicles the climb as "die Erste Durchnagelung" of the north wall and we are inclined to agree that probably the conquerors are better blacksmiths than rock-climbers. They should certainly be made to join the quarrymen's union. Their work must, however, have been of an inferior quality as the two brothers, Peter and Paul Aschenbrenner, who repeated the ascent a month later, September 11th-12th, reported that many of the pitons were unusable owing to their looseness.

Report in the American Alpine Journal, 1934.. In contrast, the women who climbed with these same guides wrote glowing reports of their skill and daring. All of these Eastern European climbers were, in fact, better rock-climbers than blacksmiths.







The famous Fünffingerspitze (five-finger spires) in the Dolomites.

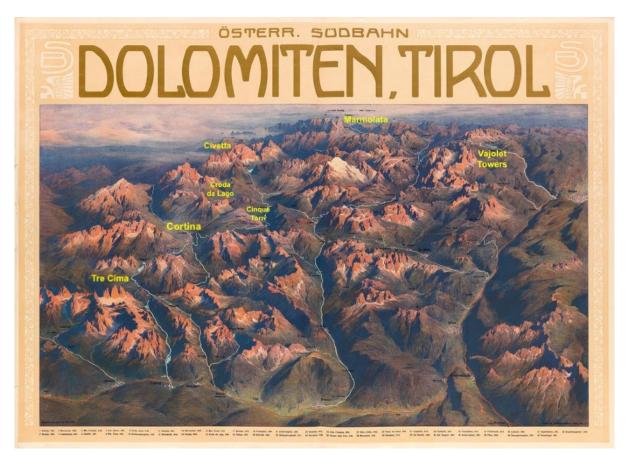




Emmy Hartwich-Eisenberg, photographed here with Paul Preuss and Walter Schmidkunz in 1911, wrote a tongue-incheek article about men's perceptions of women's climbing in 1924 and would have probably been ironically amused at this 1932 cover depicting a woman alpinist.



ranken Skerdep.
TRIGLAV. N. F.



Gustav Jahn's incredible 1900s "Dolomiten, Tirol" travel poster, aerial view looking south, annotated with a few key climbing objectives for visiting climbers. The rock-specific tools and techniques that were practiced here made their way to the USA in the mid-1920s.

European training grounds

For American climbers, venturing across the pond to the Western Alps to climb alpine and rock routes had also become a rite of passage in the 1920s. Zermatt and Grindelwald in Switzerland were common destinations for alpine climbers interested in mountains like the Matterhorn. For rock, popular routes included the Dent du Géant and the famous Grépon⁷³, dream climbs for many climbers; Chamonix in France is the epicenter of these climbs.

As the Dolomites became increasingly more "friendly" to American tourists after Italy's annexation of south Tyrol (1919), the previously war-torn border town of Cortina in Italy became another prime destination for American rock climbers, with accessible peaks noted for their difficulty, exposure, and less severe alpine weather. For rock climbers, the Cinque Torri ('five towers') was an initial target, with plenty of good training climbs as a prerequisite for the longer routes.

⁷³ Footnote: In 1929, the American Miriam O'Brien famously climbed the Grépon "manless" with Alice Damesme in 1929. Miriam first led the crux rock climbing pitch in 1928. More to come.



South Tirol was annexed to Italy in 1919. Cortina on the border became the initial Eastern Alp epicenter for American climbers. The Northern Limestone Alps (Kaisergebirge, etc.) in the more politically turbulent Germany/Austria, still reeling from WWI, were still relatively unknown.



Another nice European Alps map.

Women's climbing standards, 1920s

The varied attitudes of the British climbers are important to understand how the position changed in 1920s America, where most mountain climbers still followed and held fast to the traditional and strict no-piton ethic; alternate information from the Central Empires (inc. Germany and Austria-Hungary) had previously been limited during WWI, and any steel hardware techniques were considered simply as the slippery slope to complete mechanization of the mountains.

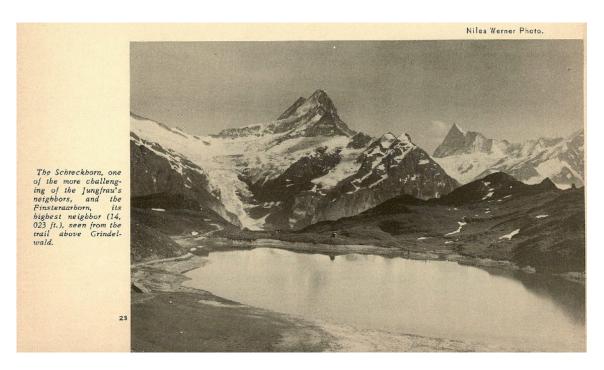
Among women climbers, there were highly respected athletes from other nationalities. especially in the pre-WWI period, such as Jeanne Immink (Netherlands), Pavla Jesih (Slovenia), Irma Glasser (Austria), Vineta Mayer (Austria), Ilona and Rolanda Eötvös (Hungary), and Kathe Bröske (Zabrze, now Poland). And in the period leading up to the early 1930s, there were a number of up-andcoming European rock stars, climbing at the highest standard using the latest tools and techniques, such as Mira Marko Debelak in the Julian Alps and Paula Wiesinger in the Dolomites. Among American climbers, perhaps the better-known leading international women rock climbers in the 1920s were from the French and Swiss Alps. such as Marie Marvingt in the early era and later Micheline Morin and Alice Damesme. 74

Whence inspiration?

Climbing is a theatre where an actor's inspiration comes from a range of heroic stories often of an unfamiliar place, fantastic and wild, with challenges approached and overcome. The central act is the struggle for the clear summit goal, or perhaps an intense experience along the way. The heroes and their imagined experiences beckon. As there was not a lot written about the strongest contemporary women rock climbers in the 1920s English-speaking journals, along with the fact that few clubs stocked the Eastern Alp Journals in their libraries, it is not clear to the degree to which the leading international women climbers were inspired by each other, but archetypes in other fields also led by example.

In the mid-1920s, American climbers first learned the potential of the 'special techniques' developed in the Eastern Alps on difficult Dolomite climbs. Several of these climbers were women who were pushing the boundaries of convention on the most feared rock climbs of the Alps. One of the inspirational legends in this respect was the internationally renowned Gertrude Bell, so let's first consider one of her epic climbs in Switzerland.

⁷⁴ Footnote: Many of these pioneering women were not just climbers but excelled in a number of adventurous pursuits, including skiing, aviation (airplanes and balloons), mountain and polar exploration, diplomacy, you name it. In English-speaking alpine journals, it was more common to see reports of mountain climbers such as Dora Keen (USA), for her first ascent of Mt. Blackburn in Alaska in 1912 (the second major Alaskan peak after the famous Abruzzi expedition to Mt.Saint Elias in 1911—she also had climbed testpiece rock routes in the Alps); Freda Du Faur, for her ascent of Mount Cook; or Hettie Dyrhenfurth (Swiss) for her participation in an expedition to Kangchenjunga (1930). It would be fair to say the comparable rock climbing accomplishments by women in this period have been marginalized (or absent) in many histories, and still incompletely researched, and discussed in Volume 1 of this work. Primary sources have many vague references to little-known climbers probably at the top of the game (e.g. Miss Gret, Miss Fitzgerald?, though some were known internationally, e.g. Rita Graffer and Mary Varale). The few who wrote books in this early era are happily remembered, such as the Ladies Alpine Club member Nea Barnard (later Nea Morin), who published her memoirs in A Woman's Reach (1968). Modesty was a highly valued characteristic back then, as it still is with many climbers today (and throughout the timeline)...you know, the climbers you have never heard of, then realise a climb they have done was out of this world--see David Lama quote in this volume--you just have to look at the creations (and in context).



The Finsteraahorn on the right, with the stunning NE ridge on the left skyline. (Summit, 1957). The first successful ascent in 1904 was considered the first of the great north walls in the Alps to be climbed.



WELLIGRAT, FROM KLEIN WELLHORN.

Another climb of Gertrude Bell, who had written of the climb: "Vorder Wellhorn, July 14, 1902. We have done the first of the impossibles, the Wellhorn Arete." E.L. Strutt wrote of Bell in 1926 after her death, "In the period 1901-1903 there was no more prominent lady mountaineer. Very few surpass her in technical skill and none to equal her in coolness, bravery, and judgment." Miriam O'Brien climbed the same route on August 25, 1930 with Alfred Rubi.

Gertrude Bell (1868-1926)

The remarkable English polymath Gertrude Bell focused on climbing for five years (1899-1904) with a phenomenal list of climbing accomplishments, still enviable decades later. Among many of her visionary climbs, she imagined an improbable new climb up the steep knifeblade NE rib of the Finsteraahorn, the most prominent peak in Switzerland. Her 1902 attempt on this elegant line ended short of the summit, and the account of their descent became an epic tale of the era, an epoch of exploration already abundant with gripping survival sagas from around the globe. As bad weather set in at a particularly perilous section with tenuous route finding, Bell and her guides Ulrich and Heinrich Fuhrer's retreat involved two days and nights amidst avalanches and desperate bivouacs, with many close calls managing endless rappels with frostbitten hands and feet. Only through incredible teamwork, courage, and perseverance did the team survive. When this route was finally climbed in 1904, it established new levels of commitment on long alpine rock routes (1000m).

Gertrude Bell died in 1926 in the midst of a prolific diplomatic career in the Middle East, but her incredible career was celebrated in global news and she became an exemplar to many. Her line on the Finsteraahorn became a leading objective for the American climber, Miriam O'Brien. Among Bell's difficult climbs, many were made possible with the state-of-the-art tools coming online at the time in the Eastern Alps. In her journals, she writes of some training climbs:



BERNER OBERLAND August, 1901: Yesterday my guides and I were up at 4 and clambered up on to the Engelhorn range to take a good look round and see what was to be done. It was the greatest fun, very difficult rock work, but all quite short. We hammered in nails and slung ropes and cut rock steps-mountaineering in miniature. Finally we made a small peak that had not been done before, built a cairn on it and solemnly christened it. Then we explored some very difficult rock couloirs, found the way up another peak which we are going to do one of these days. ... I shall probably stay here till Sunday morning which will give the snow time to get right. Then I shall return to my great schemes...⁷⁵

⁷⁵ Footnote: there are several other references to Gertrude Bell's use of pitons (then known as 'nails'), notably in 1902 on the Wellhorn, where she succeeded only 'with the aid of an iron nail driven in the worst place and of a double rope.' Miriam O'Brien notes of that climb, "At that time, apparently, pitons were not so much in disfavour with English Climbers as they later became!" (Give me the Hills, 1957). Regarding "cutting rock steps", note that sculpting hand and foot-holds in rock with a hammer (or ice axe) was a tolerated technique well into the 1930s (see Rudatis, 1931).





Gertrude Bell (left) and Miriam O'Brien (right).

Enter Miriam O'Brien (1899-1976)

In 1931 Miriam O'Brien reflected on Gertrude Bell's great schemes, in "On Some of Gertrude Bell's Routes in the Oberland" (AAJ, 1931), a tribute article that also revealed her own focus on steep visionary new rock-climbing lines. In the previous era, mountaineers were often modest in their published reports of varied difficulties, some even with extreme reluctance to make any claim at all, as in the case of the talented Benedikt sisters, who roped up with Conrad Kain. Miriam's eightpage article on Bell dispenses with modesty and explains the raw commitment and severe challenges Gertrude Bell overcame, based on her own experiences and successes on the hardest testpieces of the day. Miriam became a leading climber amidst a group of East Coast American rock climbers in the 1920s-1930s period, which included many talented women such as Margaret Mason Helburn, Elizabeth Knowlton, Majorie Hurd, Betty Woolsey, Florence Peabody, Winifred Marples (British), Julia and Julia Colt (mother and daughter), and Jesse Whitehead (a Briton who moved to the USA in 1925).

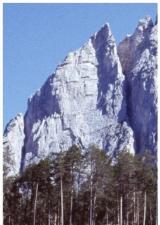
Miriam O'Brien first roped up in 1920 on the Grand Muveran during one of her annual summer family vacations in Switzerland. Imagine: she loves the moment, and each summer returns to the mountains. In 1924 in a mountain hut, she meets George Finch (see Australia section) who tells her, "You can do the Matterhorn." Climbing becomes her game. On local Boston crags and later on climbing trips to the American west, she discovers her natural affinity for balance climbing on steep rock. In March, 1926, she joins Margaret Helburn on a winter road trip with the "Bemis Crew," a group of hard-core alpinists and rock climbers within the Appalachia Mountain Club. The trip cumulates with steep rock climbs on "the walls of the cirques of Katahdin", the highest mountain in Maine. Inspired by the steep unclimbed rock walls, a few months later, she travels to the Dolomites looking to engage the "right" guides to learn the craft. She writes, "In common with many women, I felt that these Dolomites were made just to suit me with their small but excellent toeand finger-holds, and pitches where a delicate sense of balance was the key, rather than brute force. While it helps of course to have tough muscles, the prizefighter would not necessarily make a fine Dolomite climber. But the ballet dancer might."

First Dolomite Season

Indeed, Miriam proved to be a leading ballet dancer on rock. Planning her first trip to the Dolomites, she writes in her autobiography (1957): "Rock climbing was what I wanted. I would start in the Dolomites and later go on to Chamonix and its granite aiguilles." Within a few prolific seasons of rock routes in the Alps (1926-1928), she was leading top-level rock climbs and becoming wellknown for her ability on both sides of the "pond". In her first year (1926), after a few training climbs, she climbed the Punta Fiames by the Spigolo, a futuristic 400m route established by Käthe Bröske and Francesco Jori in 1909, which followed a bold arete. Her understated report in Appalachia (Notes on Three Dolomite Climbs, 1926), notes how her guide, Angelo Dimai, led a difficult pitch with only a small fish line attached, as "the weight of the regular rope would be enough to upset his balance and pull him over backwards." Though Miriam was second on the rope, this climb would have been

considered harder than any of the long rock climbs in Colorado at the time (Crestone Needle or Alexanders Chimney) and thus harder than anything in America. Miriam would soon be leading routes of this difficulty.





The original Antonio Dimai/Angelo Verzi route up the center of the wall was climbed in 1901. Käthe Bröske and Francesco Jori first climbed the arete in 1909, and the route became known as "Spigolo Jori."



IV. FUNTA HAMES, BY THE SPIGOLO
On July I, I went up the Spigolo of Punta Fisances. This was a difficult and delicate climb which only a few people had done by 1926. And it was, quite seriously, considerably more difficult in those days before the general use of pitons. Prom are those metal apikes, some six inches long, that you hammer into reversies in the rocks. They have a loop or ring at the end through which you snap a carabiner, which is much like a large and strong safety-pin. Through this catablor in turn you thread the rope and the whole arrangement adds considerably to the safety of the climb, as well as making it distinted easier. Pitans were just beginning to come into use at that time. In those early days, ore tain dishues looked down or them as just one more artificial add that was not quite sporting. But styles change, and in order to do more and more difficult climbs, people must of necessity make more and more use of artificial adds. Some climber have made otherwise impossible ascents by drilling a line of holes in the rocks and putting in expansion or contraction both, up which they climbed. Although I belong to the generation which feels that may be going a faitle fair, I don't like to take a dogmaria prestition on the question. It's to easy to date yourself by the things you disapproached for processing the service of the production of degree. PUNTA PIAMES, BY THE SPIGGI Consider the following list, all artificial: clothing, boots, nails in boots, loc-asso, evanpone, faithbury rope, roping-down rope, pitens for security, pitens as direct elimining nids, expansion bolts, rope-ladders, oxygen, beancedrine 'pep' pills, etc. Where will you draw the line? Or why draw one? (Yes, one must draw one after all. For it wouldn't do to land by helicopter above all the difficulties and 'climb' a peak by strolling up the final few easy feet)! I don't think I regret, though, that I did my rock-climbing in those simpler days when it was still done pretty much with one's own arms and legs, fingers and toes.

misst as many when it is hard to tell where cole-climbing ends and engineering begins.

When we elimbed the Spigolo in 1928 there was not one single piton anywhere on the route. The Spigolo route diverge from the regular one about hafteny up and traverses over to the future of the spigolo route diverge from the regular one about hafteny up and traverses over to the future spigolo route. The climb has not startly a spigolo route diverge from the spigolo route of the spigolo route and a haff bours. The climb has not starping places quite infrequent. The childs were small spicol call all the spigology and occasion. The childs were made belong the spigology places quite infrequent. The childs were small such a Angelo rout a master. The hardest pitch was a smoothy in blanch and child and the spigology of the spigolo

what glorious fun it was!

what glorious fan it was!

Several years later Angelo and I made the first descent of
the Sigolo and I was astonished to see a few pitons here and
there embedded in the rock.

'I put most of those in myself,' said Angelo, 'when I took
King Albert of the Belgians up this climb. It wouldn't do, you
know, to have any accident happen to the King, . Of course,
when it's only you,' he added quickly, with the customary
twinkle in his eye, 'it wouldn't matter.'

The arete of Punta Fiammes/Fiames. Miriam reports no pitons on the Spigolo (arete) route in 1926, but in the ensuing years, many would be added, some by Angelo Dimai, who climbed it with Miriam and later with King Albert I of Belgium. Miriam recounts Angelo's explanation of the added pitons, "'I put most of those in myself,' said Angelo, 'when I took King Albert of the Belgians up this climb. It wouldn't do, you know, to have any accident happen to the King... Of course, when it's only you,' he added quickly with the customary twinkle in his eye, 'it wouldn't matter." (Give me the Hills, 1957).

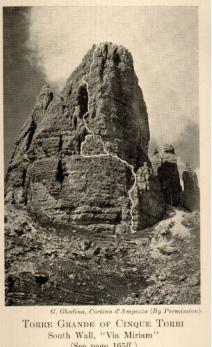
Second Dolomite Season

In her second Dolomite season (1927), Miriam's first route was "one of the most difficult in the whole Dolomite region", the south wall of Torre Grande in the Cinque Torri range, a guided climb with her climbing partner Margaret Helburn. This was a stateof-the-art route, with piton belays and anchors strategically placed for the Grade V+ free climbing (the top of the free climbing scale). They were guided by the father-son team of Antonio and Angelo Dimai, with guest-star guide Angelo Dibona joining the team. Antonio's two sons, Angelo and Guiseppe, and the Cortina guide Arturo Gasperi had previously climbed and preequipped the route with strategically placed pitons in preparation for Miriam's arrival that season, and honoring Miriam by naming the climb the Via Miriam. A week later, Miriam climbed it with her team in 3.5 hours, falling a few times and weighting a piton at one

point, and later devoting three gripping pages of detail of the difficulties in her autobiography, Give me the Hills (1957).

In Italy, the route was celebrated and Miriam's feature article appeared in the 1928 Rivista Mensile, the journal of the Italian Alpine Club. In Britain, the route was controversial—the style of Via Miriam was considered as merely 'facilitated' by ironmongery, lamenting how modern guide's 'mountaineering" skills had been replaced by piton-protected 'acrobatism', considered 'more or less unjustifiable'. In contrast with the honored Antonio Dimai, considered "the finest cragsman in the Eastern Alps" (Strutt, 1941), and who reportedly only used pitons for belays in his long career, the Alpine Journal's consideration of Antonio's avantgarde sons was less flattering—they 'inherited their father's skill' but failed to inherit 'all of his methods' (AJ1933).





(See page 165ff.)

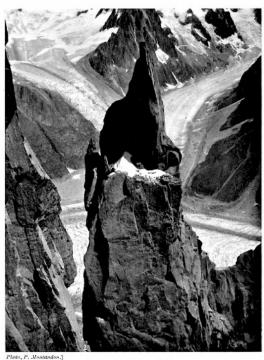
Via Miriam feature article in the 1928 Italian Rivista, and the line as depicted in the December 1928 AMC Bulletin. The route became a European rock climbing testpiece for the East Coast Appalachian Mountain Club (AMC) members. Elizabeth Knowlton climbed it with the Dimai borthers in 1928.

le acrobazie degli altri compagni.
Un piccolo crepaccio non molto difficile,
che si trova al dissopra della cava, ci guida per
circa 8 metri ad un sito ameno e dominante
con uno sbalzo di roccia in alto e, per quanto
il nostro sguardo potesse abbracciare, con una
parete levigata a destra. Quivi giunti, l'unica

Miriam had no such qualms about the new methods, and throughout her life, she was proud of the route named in her honor. For Miriam, it was her first direct exposure to the techniques that would soon also enable new bigwall standards in America. Her complex relationship with the 'ethics' and 'morals' of pitons, which she frequently shares in her writings, also begins. She continued to progress her skills with Angelo Dimai for many years, often leading crux pitches on routes new to both her and Angelo (a guide letting a client lead was rare—Antonio Dimai would always climb first, but "with Angelo I could lead all I liked, just so long as we were out of sight of his father", Miriam writes). Her growing lead skills fueled her guideless and manless climbing goals, and she became known for decades as 'America's foremost woman climber', as still noted in the March 1961 Summit Magazine.

French Alps

In her seasons on the Aiguilles of Chamonix, Miriam was no less accomplished, climbing many of the hardest alpine and rock routes in the Mont Blanc range. In 1926, she began with moderate guideless climbs with her brother Lincoln and others, noting, "I planned soon to do more and on a bigger scale," and here in France, she also found the 'right' guide for her progression, Alfred Couttet, one of the early French guides to adopt pitons for harder routes. "Couttet was using pitons, and using them skilfully. But at the time he wished it kept a secret!" she



Amuille de Roc du Grépon.

AIGUILLE DE ROC DU GREPON, 3409m. Photo: "In the Mont Blanc Massif and the Oberland" (Miriam O'Brien, AJ1929).

writes. Couttet also broke guiding convention by seconding Miriam's leads on hard climbs. In their second season together they climbed a long new route on the Aiguille de Roc du Grépon that involved twelve rappels to descend; it was an auspicious start to Miriam's expansive repertoire of hard climbs in the Alps with and without guides, and many with other top women climbers of the day. ⁷⁶

⁷⁶ Footnote: In addition to famous more alpine climbs like the Matterhorn, Jungfrau and the Mönch (first 'manless' ascents), as well as endurance traverses, Miriam climbed the Western Alps rock testpieces like the Grepon multiple times by various routes—her famous 'manless' climb of the Grépon in 1929 with Jesse Whitehead and Alice Damesme (who led the Mummery crack on that occasion), though by no means her hardest climb, became globally known; her account was published in the August 1934 National Geographic magazine, no doubt patronizingly edited, or at least captioned: "A strong wind bothers a lady, though she has no skirt to worry about", etc.— the many sexist comments that accompanied the press about her climbs are not included in this research, but they are easy to find. Likewise, there is not space to include some great epic tales like her attempt with Angelo on the Fehrmann route on Campanile Basso, where they had to sit out a gusting sleet storm on a 6" ledge, or of her travels and dreams in the Kaisergebirge and Julian Alps.

AIGUILLE DE ROC DU GREPON m. 3409 (Cat. del M. Bianco - Sottogr. Aiguilles de Chamonix)

Ia. ascensione. - Signorina Miriam O' Brien con A. Couttet e G. Cachat, 6 agosto 1927.

Lasciato il Montenvers alle 2.20, venne attraversata la crepaccia di Trélaporte alle 5,20. Dopo aver seguita la via ordinaria della Tour Rouge, si attraversa il canale che discende dalla forcella de l'Aiguille de Roc (caduta di pietre). Si continua ad innalzarsi sulla sinistra, poscia per facile rocce direttamente ad una zona di larghi terrazzi posti immediatamente alla base delle placche del primo torrione importante della cresta che discende dall'Aiguille de Roc, sul margine del grande canale Aiguille de Roc-Grépon. Dai terrazzi (ore 7,50) si attraversa verso la sinistra per guadagnare un lungo canale molto stretto e parzialmente nascosto, che sale alla cresta passando dietro al grande torrione sud-

detto. Si sale per esso per circa trenta metri lungo la sponda sinistra, attraversando poi a quella destra e proseguendo per placche di media difficoltà verso la sommità del canale, individuata da una forcella della cresta dietro il torrione. Da questo punto hanno inizio le difficoltà principali: si attraversa verso sinistra per una cengia che termina in un camino alla cui sommità si obliqua dapprima decisamente a destra, poi si sale direttamente una quarantina di metri per placche e fessure veramente difficili, per riprendere più in alto la traversata a destra (cengie delicate) e ritornare in seguito sulla sinistra, alla cresta delimitante questa grande parete di placche (è la cresta che fiancheggia il canale fra l'Aiguille de Roc ed il Bec d'Oiseau). Si afferra tale cresta al disopra di una serie di piccoli gendarmi, ove incomincia l'ultima parte della salita: seguesi il fil di cresta pervenendo così alla base del grande camino sommitale alto circa 35 metri, in alcuni punti strettissimo, e con appigli fra di loro distanti. Al sommo del camino si sbocca sopra una piccola piattaforma dalla quale si vede di fronte la parete del Grépon. Innalzandosi di qualche metro, il capo cordata lancia la corda sopra un torrione roccioso foggiato a fungo, tre o quattro metri sulla sinistra: mediante il pendolo e con la scalata diretta su tale torrione è possibile raggiungere la vetta dell'Aiguille de Roc (ore 11,20).

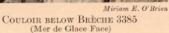
Ritorno per la medesima via con 12 discese a corda doppia.

E' una splendida scalata di roccia con difficoltà serie, paragonabile alla salita del Grépon dalla Mer de Glace.

(Da Annuario G. H. M. 1928 pag. 31).

Miriam O'Brien's new route in the on the Grépon (1927), her first new route in the Western Alps, as reported in the Club Alpino Italiano.







Couttet on Traverse
(North Face, Aiguille de Roc)

A series of rappels down the couloir (left photo) was the approach to Miriam's 1927 new route on the north wall of Aiguille de Roc on the Grépon. Right: one of the crux rock pitches. Running belay anchors visible. June, 1928 AMC Journal.

Swiss Alps

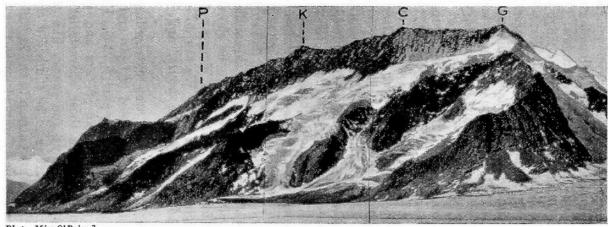
By 1930, Miriam was ready for her hardest climbs yet, long alpine rock routes in the Swiss Bernese Oberland following in the footsteps of Gertrude Bell. After a 19-hour traverse of the Dreieckhorn, she writes, "Why not repeat some more of her climbs, so engagingly described in *The Letters of* Gertrude Bell?" Here she found yet another guide, Alfred Rubi, who did not mind being second on the rope, and she often lead every pitch of long climbs of 'great endurance and fortitude'. "I enjoyed climbing rapidly" she reflects in her autobiography, and indeed, many of her climbs broke records for the shortest time. a big advantage in the wild mountains where sudden weather changes are deadly. In succession, she climbed the Engelhörner, Wellingrat, and the third ascent of the NE ridge of the Finsteraahorn, which the previous



After Gertrude Bell's attempt in 1902, the NE face of Finsteraahorn in the Bernese Alps, Switzerland was first climbed in 1904 by Gustav Hasler and his guide Fritz Amatter. In 1930, Miriam O'Brien and Adolf Rubi climbed the third ascent in 20 hours round trip, climbing steep rock mostly in mitts and overcoming phenomenal challenges of route-finding and loose rock. In her autobiography, she titles her report of this climb, "Finsteraahorn, Northeast Face, the only grim chapter." (photos from Give Me the Hills, 1957)

ascensionists had noted, "A bivouac will always be necessary." She and Rubi (with Rubi's younger brother Fritz as porter) climbed the 1000m route in 13 hours, with a 7-hour descent, the first "one-day" ascent of the spectacular line. Of Miriam's impressive resume of successful climbs, many would have been at a level of commitment as the career-best for most climbers of the day.





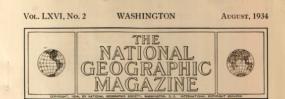
Photo, Miss O'Brien.]

P = POINT WHERE WE HIT THE RIDGE. K = KLEIN DREIECKHORN.

C = CENTRAL SUMMIT.

G = Gross Dreieckhorn.

One of Miriam O'Brien's enduro alpine traverse in the Alps, on the Dreieckhorn.



MANLESS ALPINE CLIMBING

The First Woman to Scale the Grépon, the Matterhorn, and Other Famous Peaks Without Masculine Support Relates Her Adventures

BY MIRIAM O'BRIEN UNDERHILL

ALTHOUGH climbing the big rock and ice peaks of the Alps is a sport that gains immeasurably in interest, fun, and excitement from 'doing it on your own," only recently has this been considered at all proper, even for men. For women to climb not only without guides, but without men companions, is still unusual. With a few exceptions,* women have never climbed alone.

The essence of guideless climbing consists in taking, oneself, the entire responsibility for carrying the climb through to a successful finish. This is a lot of fun, and I saw no reason why this pleasure should be closed to women, although some of my friends among the French men mountaineers trief patiently to explain to me why it was theoretically impossible for a woman to lead a mountain climb, taking the entire responsibility herself without at least mabculine "moral support."

THE GRÉPON THREATENS AND ALLURES

THE CRÉPON THEATENS AND ALLUESS
I was unconvinced, however, and I persisted, albeit very privately, in my determination to do a big climb sans showned.
Furthermore, I vowed it should be the
traverse of nothing less than the most
- The baronesse Rolands and Illons Edivis,
of Budapest, did several Dolomite climbs shortly
before the war, and three English women, Mis
Bray, Mis Dorothy Pilley (now Mrs. Hurst),
Richards), and Miss Wells (now Mrs. Hurst),

famous of the Chamonix Aiguilles, the Grépon itself! We should see whether women could climb on their own!

Of course, the Grépon—I barely acknowledged this ambition even to myself—was not to be thought of as a first manless climb. Though I had led it the year before (to "lead" being to go up first on the rope), I had taken with me a professional porter, a man capable of assuming the entire responsibility and doubtless certain in his own mind that he had done so.

Far more difficult than anything attempted before by women alone, though not to be compared with some recent climbs, the Grépon had counted for years as one of the bardest rock climbs in the Alps—one that even some of the licensed Chamoning guides cannot lead. It needed working

nix guides cannot lead. It needed working up to.

The Peigne (about 10,500 feet), another one of the Chamonix peaks, seemed suitable for a beginning, since, while lower and less difficult, it is in many ways like the Grépon, with bold, sweeping, vertical lines and sheer granite walls. Women had climbed it with men, but never alone. Fortunately, I had right at hand a friend, Miss Winfired E. Marples, of London, who felt as I did about manles climbing, and with her I set out. In the evening of August 13, 1929, we arrived at the little chalet of Plan de l'Aiguille, some 4,000 feet above Chamonix and just under the Peigne.



Complex Relationship

Miriam's relationship with tools was complex; in her writings, she frequently makes attempts to explain the 'morality' of pitons—the line of acceptable use as they became adopted during her career as a climber. Of her early days (pre-1928), she writes of a climb that went awry, "Not one of us in those days would have stooped to carry a piton," despite the fact that she had already climbed some very difficult pitonprotected routes with guides by that time. Climbing without 'artificial aids' was the goal, and big routes like the north wall of Cima Una. an 800m route which she climbed with Antonio Dimai in seven hours in 1928, were climbed piton-free; she laments how subsequent climbers added many 'unnecessary' pitons, and ponders the balance between risk and skill, a central theme in all realms of climbing. In her later years, she writes,

"But the piton for security is something else. We have all heard younger climbers tell us, with impatience, that they do not use pitons to help them get up, but merely to make the climb safe, and that it is exactly the same climb it was before, only safer. It most definitely is not the same climb. These modern climbers are getting from their pitons enormous help without admitting or, perhaps, even realizing its extent. And in this, to my mind, lies the more questionable ethics of the piton."

--Miriam O'Brien Underhill, Ironmongery Then and Now, Yearbook of the Ladies Alpine Club (London), 1957.)

In the 1950s, when she wrote this, America was undergoing a big shift in technological climbing—reusable chromoly steel pitons were coming online, allowing a smaller rack for bigger climbs, and bigwalls like El Capitan were first being considered. "I have no quarrel whatever with direct-aid pitons," she writes; her concern was for the adventure lost on overly protected free

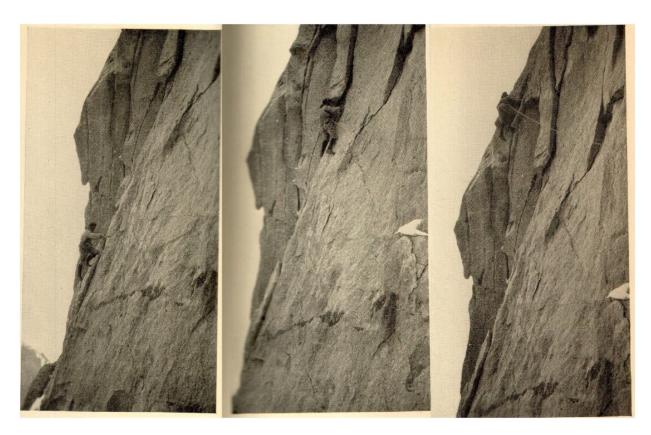
climbs: "It is not the same climb (with more pitons), because the piton removes or greatly mitigates the penalty for failure... For even if the modern climber never needs to use these pitons, they are there, removing from his mind a great weight of responsibility." Her preservation of challenge argument with balanced risk would be closely repeated by older climbers when bolted sport climbs became a main game in the late 1980s in America, a time when the acceptable moderate use of bolts was closely defined and an oft-debated 'rule of the game'.



Schreckhorn (our ridge of ascent on the left skyline).

Another fine climb by Miriam O'Brien.

In her early days, however, Miriam's attitude toward pitons was softer. In 1931, she recognizes the standards of difficulty are higher than in the 1920s due to "recent developments in rock climbing technique and skill" and writes, "The raising over the years of standards of difficulty is due in large measure to the use of improved equipment, and particularly of pitons." This was a period of rapid expansion of piton-protected climbs in Europe, which was followed by a similar wave in America a few years later. She comments on how Armand Charlet, a critic



In 1928, Miriam climbed all five pinnacles of the Aiguilles du Diable with Robert Underhill and guides Armand Charlet and Georges Cachet. Photos on the crux rock climbing section of the traverse, the first hundred feer of the Isolée. Miraim captions the center photo in Give Me the Hills: "Armand Charlet wedged his ice-axe in the crack to the left of the downward-projecting tongue of rock."



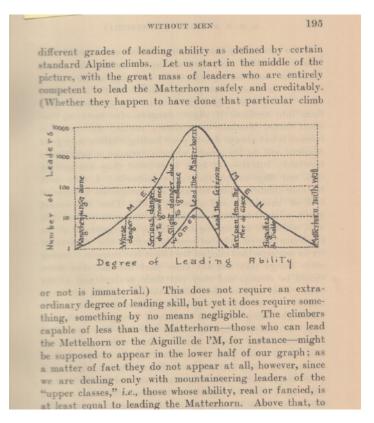
--France's most distinguished guide, Armand Charlet (Mountain Magazine obituary, 1976)

of pitons except for roping down, had no qualms about leaving his jammed ice axe in cracks to protect difficult sections. "Morally, I see little difference between using a piton and jamming in the ice axe."

But it was not just hardware that Miriam adopted as she became America's leading rock climbing maestro. She learned from the best and holistically understood the new climbing systems. Of potentially catching a fall on a climb in France in 1926, she writes, "the chief rule is: don't try to stop the fall abruptly but let the rope run a bit and brake it gradually", perhaps the most succinct explanation of a dynamic belay until Richard Leonard's analysis in Belaying the Leader (1946). She also developed nuanced skills in using carabiners and slings, as evidenced by the impeccable teamwork with her partners, especially on her efficient 'manless' alpine ascents. She understood the advantages of longer ropes, sometimes equipping 150-foot ropes for certain climbs in a time when much shorter ropes were 'normal'. And she was an expert in rock

climbing footwear, the scarpa da gatto, shoes with layers of woolen cloth or rope soles ('best when old and therefore well-conditioned'), and the trade-offs with the rubber soles of 'sneakers' also becoming popular around this time.

All this information Miriam would bring back to the USA after each summer season in the Alps, where she climbed on the many local crags of the East Coast, where almost certainly, these new techniques were first practiced. But it was her on-and-off early climbing partner and future husband, Robert Underhill (whose breadth and depth of experience on cutting-edge routes in the Alps was much more limited), who became the main spokesperson for the new tools and techniques in the early 1930s.77In this early period, at the height of her rock climbing career, Miriam was content just to write about her experiences, and avoid the ethical dilemmas that came with exposing the new tools and techniques. Miriam also became an expert skier and continued climbing throughout her whole life, with many productive climbing trips to Europe and the American West, including new routes in the Sawtooths (Idaho) and the Beartooths and Mission Ranges (Montana).



Miriam O'Brien's "Degree of Leading Ability" (AMC Bulletin, 1932), compares women to men's abilities, though she and other women at the time were close to the highest degree of leading ability (note Aiguille du Diable). The 1931 North Wall of Matterhorn was widely considered the world's hardest climb.

⁷⁷ Footnote: Underhill was not the first to expose the new techniques, however, see Dean Peabody, On Belaying, Appalachia 1930. In 1931, Underhill published an eight-page treatise on rope techniques in the Sierra Club Bulletin (California) elaborately explaining how persons A, B, and C might make their way safely up a mountain with 'legitimate' use of the rope, and with instructive photos on various body belay methods (and perhaps the first expose on the use of slings). In the 1932 Canadian Alpine Journal, Underhill provides photos of the new hardware (pitons and carabiners), as well as the best sources of mail-order supply. But by 1932, the cat was already out of the bag (see Sturmia's much more detailed 1932 article). In his travels he was also influential — Bestor Robinson credits Underhill's influence on California rock climbing in a 1934 Sierra Club Bulletin article: "The seed of the lore of pitons, carabiners, rope-downs, belays, rope traverses, and two-man stands was sown in California in 1931 by Robert L. M. Underhill, a member of the Appalachian Mountain Club, with considerable experience in the Alps." In 1933 Underhill also published "The Technique of Rock Climbing" in Appalachia, of which he was the editor. Underhill's note in 1932 CAJ: "The modern piton has been developed by the Germans and Austrians, and taken over from them by the Italians in the Dolomites and, in some degree, by the Swiss. It is best and most cheaply purchased in Munich and Vienna. Reliable dealers are: Sporthaus Schuster, Rosenstrasse 6, Munich, and Mizzi Langer-Kauba, Kaiserstrasse 15, Vienna VII. Illustrated catalogs are obtainable from each a summer catalog of mountaineering equipment (and a winter one for skiing). The pitons sold in France and for the most part in Switzerland are still much too long and heavy, and not of the best model (the Fiechtlhaken)."

New Rock Routes at Katahdin

By MARJORIE HURD

To those mountaineers who could not leave New England in the summer of 1928 to climb in Europe or the western mountains, Katahdin seemed to promise opportunities for sport. The A. M. C. party of six who spent a week at Basin Ponds Camp found this promise abundantly fulfilled. Besides the actual climbs made, considerable scouting was done and numerous routes prospected which show this to be an excellent center for climbing of a high degree of interest and difficulty.

On our first morning a tramp of forty-five minutes brought us to Chimney Pond and our first view of the walls of the Great Basin of Katahdin. These rise in a semi-circle of stupendous cliffs seemingly sheer from the shores of the pond. Examination showed occasional strips of bushes breaking the cliffs and to the left the great gullies with their intervening ridges leading toward Pamola and Chimney Peak. These latter appealed to us as offering the best possibilities of routes to the Knife-Edge. We decided for our initial climb to start up the Chimney and above the first chockstone swing out to the left into a hanging gully which headed in Pamola. After ten days of rain we found our path in the brook bed to be so filled with water that it was not until an hour and a half after our start that we reached the foot of the Chimney (9.50). As we stopped here to catch our breath after the steep scramble and to change to climbing shoes, we could see above us on the right a spectacular sheerwalled gorge, which owing to its steepness and wetness did not look promising; an open gully to the left is the notorious Chimney. Its floor is filled with blocks lying at an easy angle up which we scrambled to the foot of the first chockstone. Here we met two men contemplating the climb whom we offered to help over the difficulty. Since two men from Washington had joined us at Millinocket our party now numbered ten. Despite the wet and cold our leader, Lincoln O'Brien, forced a way up inside the chockstone while the rest of the party shivered in the icy spray and struggled with the new rope, 118



PAMOLA AND THE CHIMNEY

- ---- Route of August 12th
- Route of August 14th Route of August 16th (in part)

Early East Coast visionary 'Airy' lines climbed and described by Marjorie Hurd in the December 1928 AMC Bulletin.

the hardest, while that first done by the Odell party in March is next in order of difficulty and offers the best practicable climb. The central gully is probably most interestingly used as a route of descent. Conditions will undoubtedly vary from year to year, and it is as yet uncertain whether March or April is the better month for the purpose. The latter has sepecially in its favor the fact that the breath of spring is in the air, which adds a zest to the climbing unknown in any other month save October. Always supposing the weather has not become too warm, the greater lateness of the season also means, in general, more ice and néel and less ordinary snow. There seems in any case little doubt that such snow and ice climbing—along, be it never forgother, with sking—is the appropriate activity for the White Mountains in spring, and is destined to open them up at a season when they have been supposed to offer little but discomfort to the moun

Rock Climbing

ROCK CLIMBS AROUND BOSTON.—"But where do you find to climb?" in Rock CLIMIS AMOUND BORTON.—"But where do you find to climb?" is usually the first question saided the enthusiast who extols rock climbing. "I suppose you have to go to the White Mountains." Although magnificent rock climbs have been made and are still being worked out in the Moun-tains, plenty of nearby rocks have been located to give everyone a chance to practice the sport of rock climbing near home. From a scan half doesn the number of places offering numerous courses has grown to the present light of fifteen. All these may easily be reached and climbed in a Saturday afternoon. No rocks which have but one or two routes, or offer mere scram-bling and included.

bling, are included.

Hardwick Quarry, West Quincy. 12 miles from Boston. Difficult face, ridge, and channey climbing on sound granite, a competent rope leader is supported by the company of the Compan

right.

West Rozbury ledges. 9 miles from Boeton. Short courses on scattered outcrops give excellent practice.—From Center Street, West Roxbury,
turn let on Grove Street, Fisher Avenue on let Leads to the rocks. The
other side of the field can be reached from Cottage Avenue, which leads
off Center Street near LaGramps Street.

ommond Pand rocks, Brookline, 61/2 miles from Boston. A puddingstone cliff offers 35-foot courses of varying degrees of difficulty. Easy short courses on nearby belges.—From Chestrut Hill Car Station follow this results of the polyston Street to wood road on right. Cliff is on the left, 1/4 mile down this regime. Waltham, 11 miles from Boston. An abandoned open clientry with course of 65 feet. Valuable practice on unsound rock.—Cart path leads between Potter Press and R.R. opposite Roberts R.R. Station.

quarry with courses of 65 feet. Valuable practuce on unsound rock.—
Carl path leads between Potter Press and R.R. opposite Roberts R.R.
Sation.
Middless Fills 8 miles from Heston. Difficult courses on two cilifs of some
do ice.—Talce Press Street north from Medford Square through
do ice.—Talce Press Street north from Medford Square through
wood road left. Cilif on left. Continue on road, bearing right, to other
courses. Or from fare limit of trolley follow path N. to rocks.
Black and White Rocks, Wyoming. 7 miles from Boston. Opperation Miss
Street N. White Rocks, Wyoming. To miles from Boston. Opperation Miss
Street N. White Rocks, Wyoming. To miles from Boston. Opperation Miss
Street N. White Rocks, Wyoming. To miles from Boston. A steep 75-foot face.—Main Street on
left. Paths lead to a number of ledges.
Greaneod Cilif. 9 miles from Boston. A steep 75-foot face.—Main Street N.
from Melrose. Cliff is on right, close to road, a short way beyond Greenwood R.R. Station.

Caste Hill. Mislrose: Opperation Street North Melrose. Cliff is on right, close to road, a short way beyond Greenwood R.R. Station.

Caste Hill. Mislrose: Opperation Street North Street N. from
Melrose; just before reaching Greenwood R.R. Station. Curr right on
Oak Street (watch signs). At the end of Oak Street turn right, Hill is on
left shout 1½ miles from Mostowed R.R. Station. Two fields of
exceedingly rough granten Main Street.

Peobody Boulders, South Peshody. 15 misent every variety of problem on
a first of the proper of turning the Street N. from
Melrose; Just Hefore reaching Greenwood R.R. Station. Two fields of
exceedingly rough granten poort Turning to soft Tanners Fordate Too. on left.
Boulders are scattered on ridge to N. Second field: continue through
South Lymnfeld to Forest Street, on right. Eefore reaching golf club take
bridle path on right to boulder.

Internation of Turning the Hill. Eefore reaching golf club take
bridle path on right to boulder.

Well Doyl and Salem. "I urn into yard of Tanners Forded Fond to second
rock

From Myrtle Street car barn water N. N. Brown orders than rocky knoll.

Pulpit and Rocks, Nahant. 1d miles from Boston, Short courses of pulpit and the street variety, some sovere, on the sea cliffs. Low ticle is essential.

At the Nahant tide Saving Station bear left, Coaste rock is at left on top of second hill; Pulpit Rock is reached by a path through the Lodge Estate. Marjorie Hurd

Excursions

Lincoln, N. H., February 16-24, 1929. Leaders: Kenneth D. Mc-Cutcheon and J. Ashton Allis.

This was the seventh cruise of the "Bemis Crew."

The schedule which was followed—snowshoe and ski tripe on alternate days—proved successful, the two forms of exercise being complementary and using different sets of muscles.

The crew's established plan has been to take the most difficult and incessible trip on the fixed days—windless day. This plan, not amproved by

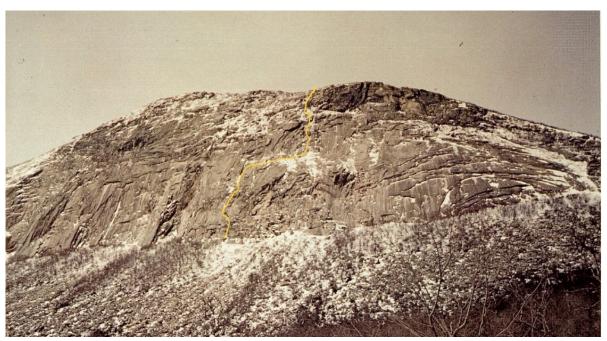
teresting trip on the first clear, windless day. This plan, not approved by those who believe in starting slowly and working up to a peak of effort, has

1929 AMC Bulletin

East Coast 'Great Leap' continued...

As more climbers like Miriam returned from Europe after climbing the latest testpieces in the Dolomites and Chamonix, a steady stream of the new climbing tools and techniques began filtering west to the USA; the new means and methods of ascent would soon become standard in America. It is probable that European pitons were being used on the big routes of the East Coast as early as 1928, a year when many of the tallest cliffs were first climbed, many by Robert Underhill, a professor of philosophy at Harvard from a Quaker family whose legacy has recently decomposed by anti-semitic views he shared (2022).

Disclosure of piton use was kept discreet until the early 1930s, but likely they were acceptably being used as described by Lincoln O'Brien in the 1927 Harvard Mountaineering Journal—as belays or for the descent. And as more Eastern Alp "Grade VI" climbers arrived in the USA like Fritz Wiessner in 1929 who quickly established new standards of difficulty, the new game was on. Bill House, Robert Ormes, Glen Dawson, and Percy Olton also became prolific in climbing cutting-edge first ascents using (and developing) the latest tools and techniques in the 1930s period. 78



Old Cannon on the 300m Cannon Cliff, first climbed in 1928 by Robert Underhill and Lincoln O'Brien, was named in the Elbsandsteingebirge tradition, where the first climb always received the "old" naming. The first ascensionists considered it "the only possible route up the cliff."

⁷⁸ Footnote: In addition to the second ascent of The Pinnacle in Huntington Ravine described earlier, the "grim titanic guardian" Wallface in the Adirondacks, steep long climbs on Katahdin, the pink granite walls of Mount Desert, and south wall of Willard, were all climbed for the first time in this period. The first pitons on a long climb in the East Coast might have been on Whitehorse Ledges in 1927.

The history of East Coast climbing is well documented in Yankee Rock and Ice, by Laura and Guy Waterman (1993, reprinted 2019) so will not be covered here, but we'll end this chapter with the line of the first ascent of the East Coast's most prestigious bigwall, Cannon Cliff. No steel pitons were acknowledged but a makeshift wood piton for a wider crack (in contrast to the only thin metal pitons available at that time) was noted as used as an aid to overcome a difficult section. In terms of technical climbing when Old Cannon was first climbed, the USA was about three decades behind Europe. But within a single decade, the art-of-the-states caught up to the international state-of-the-art, and the significant new American bigwall climbs of the 1930s will be covered next.

Postscript

For this chapter, I'd agree that it has been a long explanation of how new games with new tools begins in the late 1920s in America— really the story of how the attitude about pitons softened in the USA, as compared to no softening in the UK. To sum up: we have clear evidence of a bold and talented woman who starts climbing in the 1920s and becomes the most accomplished American climber on steep vertical climbs in the Alps. It takes place in an era when fascist attitudes were on the rise, especially among men, amidst a proliferation of propaganda films produced with new portable movie cameras (Bergfilm) glorifying the manly conquest of mountains' virginity. The English literature is filled with highly critical and mocking accounts of Eastern European climbers and their climbs, mostly imagined as "steeplejacking" and not climbing. Meanwhile, under the radar, a group of talented women, most rarely mentioned in most historical timelines despite being highly respected by their close peers at the time, quietly climbing top-level cutting-edge climbs and reporting with objective and humble accounts. Sensing the

trend in Europe, a group of American women lead the way by becoming top-level steep rock and alpine climbers, gaining extensive experience leading with the new tools and techniques, first learning from the best, then bringing that experience back to the USA. Miriam O'Brien's boyfriend and later husband, Robert Underhill, widely publishes the "beta" and historically is credited with being the forerunner of the new standards despite having a much more limited experience and knowledge of the new systems. A deeper dive into the primary sources, combined with a broader understanding of global climbing trends and attitudes, and vibrant story of the adoption of the new tools in the USA emerges.

--Posted on Winter Solstice, 2022

Thanks to Eric Doub and Sallie Greenwood for editing help.

Footnote: on Robert Underhill contributions to the knowledge base.

It is likely that body belay and abseil techniques were already known and developed in Colorado prior to Underhill's publication of articles with photographs describing the techniques, starting with 1928 AMC journal. His published articles, which mostly described techniques from the European Alps, helped expand awareness, especially in California where ropes had mostly been used to safeguard short airy traverses in the Sierras with simpler rope bracing techniques. Regarding innovators who advanced rope systems in North America, Richard Leonard in California more significantly brought new concepts and science to the art in the 1930s, from the prior art of earlier times. Summary of Underhill's earlier expository writings below:

•1928: Underhill On Roping Down, June 1928 AMC journal. Hip and Shoulder Belay and descent methods directly imported from Europe. 5/16" rope slings and welded rings recommended for rappels. Whymper's rope retrieval methods (always a bit theoretical and obsolete by that time) were described and illustrated. The purpose of a "snap-ring" described to connect two ropes around a wide boulder in lieu of a knot.

June 1930 AMC Journal: Underhill, On Artificial Aids in Climbing. "Ethical problems" discussed. On "whether it is proper to drive an iron spike of piton into

a local cliff". Justifies pitons for security as "Any aid which involves and requires a technique of its own is per se legitimate." But pitons for aid not, as there is "no new technique" in doing using a piton as a hand- or foothold (?).

•1931: Sierra Club Bulletin's famous Underhill article "On the Use and Management of the Rope in Rock Work"defining the "legitimate use of the rope". No mention of pitons even though they had been used on his ascent of Mt. Whitney that same year. Again, a revision of belay and descent ideas imported from Europe, some ideas border lining on the theoretical.

•1932: CAJ article, "Modern Rock Climbing Equipment", piton and piton hammers introduced. Very limited in breadth, especially compared to Max Strumia's article Helps to Climbers published in the AAJ the same year.

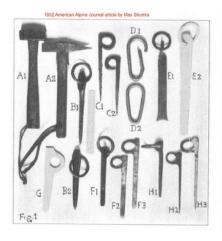
December 1933 AMC Bulletin. The Technique of Rock Climbing, Part 1, General Principles—mostly on the physical movement on rock and psychological difficulties. "We feel lost and helpless upon a great rock wall, unable to deal with it satisfactorily, anything but its master. And the remedy for this lies in becoming its master." Part II covered "The Climbing Hold" over ten pages.

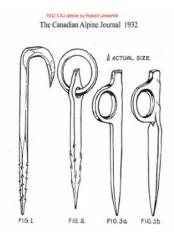


LADY CLIMBERS HAIL THIS AS FASHIONABLE WEAR

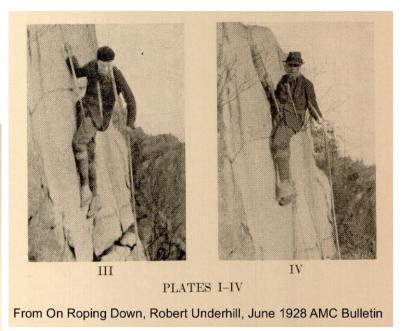
The heavy 12-point crampon designed by Grivel, of Courmayeur, Italy, lessens slipping on steep ice climbs. Iron spikes on a steel framework are hand-forged to fit the boot, and the device is fastened on by webbing or leather straps. Because her companion forgot her crampons, the author's climb on the Mönch was difficult (see page 155). On ascents over mixed ice and rock, a model without the two front prongs must be used.

Miriam O'Brien also brought attention to the latest front point crampons, a huge innovation from Europe (see Volume 1--Eiger) National Geographic, "Manless Alpine Climbing" August 1934.





Underhill was actually always a few years behind the curve of knowledge, but as editor of the AMC, was an early publisher of information of the developing tools and techniques. Left: the information shared by Max Strumia. Right: Undehill's first disclosure of the new tools (by 1932, the original Mauerhaken depicted in fig.1 were obsolete).



Robert Underhill first published information on European techniques in the 1928 AMC Bulletin, and in 1931 he shared this same information in the Sierra Club Bulletin, which helped California climbers learn the European techniques.

Fallen heroes (and the climbing/politics/war/bias interface) OPINION

NOTE: very little climbing history in the following pages--this is a long ramble about fallen heroes and shameful bias I wrote after a 2022 trip to USA where I visited the American Alpine Club library, which was in the process of distancing itself from Robert Underhill. Though my intent of this work is to make a useful collection of historical climbing research, my personal views are expressed in the following pages.

Author note: I have tried to keep my technological big wall climbing research distinct from the global political and often unpleasant worldviews that arise and fade in history. The great 1938 climbing achievement hailed in every history book, the North Face of the Eiger, is really a story of nationalistic pride (and hubris); movies like the 2008 North Face, the German historical fiction film (director, Philipp Stölzl) focused on Kurz and Hinterstoisser's attempt in 1936, which was in fact the technological breakthrough (though incomplete) ascent, cover this aspect well. The big north faces of the Alps were the most challenging, and the last to be climbed, and in this era the reputation of conquest and battle became the storylines—man (sic) verses mountain.

Now that I live in the southern hemisphere, south faces are the ones in the shade and thus more feared, but also the idea of "the line" verses "the mountain" has been freed in my reflections about climbing as I grow older. Perhaps I live a bit more isolated from the hype we still see today in the media interface between the public and the players. The long trains of oxygen-tanked climbers jumaring up fixed ropes on the big

mountains will have to hit a breaking point at some extreme, but that is apparently what provides credibility to a current mountain person. History repeats. There are great stories of folks of inspiring artists in the mainstream media, Dawn Wall, Free Solo, The Alpinist, to name a few, but there are many folks also pushing boundaries, with never a peep in the media—some who want a peep, and some who don't, some who find honor in reticence and others who subtly self-sabotage. Some forms of climbing involve quite a bit of self-inflicted hardship, so the slope to glory or obscurity can be a slippery one for the ids and egos.

Looking at history, I see a great collaborative period of climbing up to the mid-1910's, climbers sharing new tools and techniques, and figuring out new ways to explore and experience the wild vertical. Amazing women athletes are widely celebrated in mainstream media, and bias in reporting climbers accomplishments is less nationalistic than in the years to follow. In World War I and the fun largely stops, and during the "interwar period", starting in the mid-1920s, the doors of collaboration and support start to open again, only to be slammed shut with another big European war, fostering new nationalistic sentiment, the tendrils of which are still present in many climbing histories.

So it almost becomes non-sensical to try to identify periods of climbing achievement without referring to the world wars. Of course, the wars also had unexpected benefits to climbing, namely the materials and tools that were developed at a hyper-pace as part of the war efforts. So the story includes wars and nationalistic attitudes. As an engineer, I'm trying to sleuth out the engineering developments and stick to verifiable evidence relative to other developments, and often this exposes core beliefs of the thinkers and tinkerers developing new things (as well as motive, but I am a bit on the spectrum in this regard; example, I have never been able to comprehend the outlook of engineers who invent novel wide-scale killing machines like hypersonic missiles, or stealth landmines, or aerodynamic bullets that are designed to maim and shred).

In the climbing world, the current case in point is Robert Underhill, a rock climber active in the 1920s and 30s. An honored member of the climbing community. In 1983 the American Alpine Club named their most prestigious annual climbing award after him, the one given "for highest level of skill in mountaineering through the application of skill, courage, and perseverance". Its full name became the Miriam and Robert Underhill Award, but often just spoken as the "Underhill Award". Underhill married the globally renown climber Miriam O'Brien in 1932.

As chairman of the rock climbing committee of the Appalachian Mountain Club, Robert Underhill published in the Sierra Club Bulletin in 1931, "On the Use and Management of the Rope in Rock Work". This seminal piece is often cited as the article which created a leap in climbing standards and styles, similar to how Doug Robinson's articles on clean climbing led the way in 1972). Underhill did not invent the techniques he described; in fact, his contribution was just one of the first English explanations of the more complex rope techniques that had been developed in the Eastern Alps in the previous three decades. But the timing and information presented in his illustrated 24-page article has led historians to repeatedly cite his work as the one that created modern ropework and exposing new realms of vertical rock that could be climbed with reasonable safeguards such as pitons.

The article and research in the journals provided an advancement in shared climbing knowledge that surpassed the fat volume of Geoffrey WinthropYoung's 1920 *Mountain Craft*, then considered the best and most complete instructional book in English (Young was the first to document the concept of an "indirect belay", the simple engineering fact that some sort of energy absorption must be incorporated into a belay system to prevent the loads from breaking ropes and bodies—more on this next).

Interestingly Underhill did not mention karabiners, as they were starting to be known then, in his 1931 ropework article (though he

included carabiners in his 1932 Canadian Alpine Journal article). The publication of "New Helps for Climbers" by Strumia in the American Alpine Journal in 1932 with more complete information on the tools of the trade opened peoples eyes to what was possible with pitons, carabiners and slings. With the publication of these articles: one that focused on the belay, and one focused on tools, climbing in North America underwent a huge boom in big wall climbing standards in the 1930s—Shiprock, Great White Throne, Waddington, Higher Cathedral Spire in Yosemite, new routes on the Tetons and Devils Tower, to name a few, were all climbed using the newly accepted and practiced tools and techniques.

Thus, Underhill's widespread recognition with climbing clubs: the American Alpine Club, the Canadian Alpine Club, the Sierra Club, and the Appalachian Mountain Club all refer to his contributions. History books such as Yankee Rock and Ice (1993) by Laura and Guy Waterman are full of references to Underhill's climbing accomplishments, noted there as the "most important climber" of 1920s Northeastern climbing. He was involved with many of the hardest climbs of the period and was noted as a mentor to a whole generation of climbers in the 1930s.

Now, with research into his life and views, there is evidence of his shameful bias and he wrote disparaging generalizations of Jewish climbers. The article was published in Outside: Antisemitic Statements by a Climbing Pioneer Prompt the American Alpine Club to Rename a Prestigious Honor.

I agree that once such evidence is presented, individuals need to be considered in terms of any pedestals we place the characters in our histories. Many of the American Alpine Club's Underhill Award recipients hardly know anything about the Awards' eponym. But that is also a function of the increasing public hype in climbing; for example, Reinhold Messner is globally known as a great 8000m peak climber, but fewer know he also pioneered some of the boldest bigwall free climbs in his early years as well, decades before

the big wall free wave in Yosemite, and which led to his opportunity for subsequent adventures in the big mountains. Heroes are heroes, well, often because everyone else thinks of that person as a hero, even though sometimes there is only the most minimal awareness of their lineage of achievements (or of their character as a person).

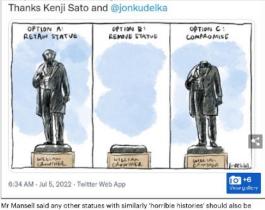
Australia has a sort of built-in mechanism to combat this. It is called the "Tall Poppy Syndrome", named after an event in Greek histories, when a despot ruler wordlessly signaled an order for the execution of the elite by symbolically slicing the heads off the tallest poppies in his garden. It feels different in America, where the impulse to have the highest pedestal always occupied means that even morally suspect individuals sometimes become the only choice.

We have "fair go" here in Australia. I was at first surprised at election time when I heard all sides of politics use the term "fairness" in their campaigns—a word rarely spoken in the marketing of some political parties in the USA. Still, I had to grow a thick skin on my first trip to Australia in 1981, where I experienced new levels of "taking the piss out of someone". As a "yank", I was sandbagged on routes and my habits became running jokes. But I was also welcomed by the many communities, and in fact, was given a "fair go". It is why I always wanted to come back—our family immigrated to Tasmania in 2008.

Statues are big in the news right now. Recently a critical report in the local news cited the "American style of statue removal" (as if there could be a "style" for these matters), for a medical doctor named William Crowther who was celebrated in Hobartown. Crowther was known to have decapitated and stolen a skull from William Lanney's deceased body, to further his career as a medical scientist (in the mid-19th century, First Nations people's bones from Australia were in demand by international scientists and sold for a high price).

The indigenous lutruwita/Tasmanian William Laney first-encountered the early British settlers at a young age, and he integrated into Tasmania society for many years. King Billy, as he was known when he met the Queen of England, was well-respected by his friends and community, but the scientific establishment still considered him a specimen

Crowther died in 1885, and when his completed statue arrived from London in Hobart in 1887, it was erected in Franklin Square, a small greenspace in the middle of the city, sandwiched between the two busiest streets in Hobart (a main bus stop area where after-school high school kids gather and sometimes fight—my son just told me of a bust-up just yesterday). The statue's plaque reads, "From a grateful public" for Crowther's political and professional services in the colony (with the timing he might have also been part of the statue's procurement). Just yesterday, the council voted for the statue to be removed, but questions remain unanswered as to what's next. Our local cartoonist, Jon Kudelka, drew what many were thinking:



For Crowther as with Underhill, the responses range from ignoring the issue altogether (the "head-in-sand" defence), to per contra questions: "Can we recognize contributions from individuals even though they perpetrated immoral language, views, or deeds?" or "The true character of that individual has been exposed, and thus implicated in heinous actions that arose from those attitudes, and it is time to erase that individual from history and any recognition".

So there you have it. Crowther probably did contribute to the scientific community in Hobart, a city which has become one of Australia's scientific centers (with CSIRO and Antarctic research centres). But he was also completely contemptuous in beheading Lanney, so perhaps the fair answer is that the disrespect should be paid in kind.

As a dad, I sometimes remind my kids as they learn to co-exist with others (and their sibling), if an offhand comment that ends up being hurtful is said, that it is more important to consider how it made one feel, and why, rather than justifying the comment, even if it actually had some validity. I try to explain,"If I unintentionally make someone feel bad, I do want to know, so I can apologise, learn, and be better, as hurting people as you go through life rarely if ever has any justification, no matter what you are 'doing' for your conception of 'good'"--oft clumsy and via the lens of a "boomer", I'm aware.

It brings up another past experience I have long pondered—the loss of a close friendship because of a disagreement on climbing ethics—in this case, of passing slower parties on climbs. A friend had once been party to an accident that seriously maimed another person. He spent a lot of energy justifying his "right" to pass, as if the better climber just automatically has senior rights. My stance was and has always been, that we were all beginners once, and watching someone solo can be scary, especially if on the same route (John Stannard soloed a lot at Carderock when I was first learning, and we watched in admiration and fear, but he always chose routes unoccupied).

To me, first-on-route has natural first rights, though it's always possible to suss the situation to see if it's possible to politely pass (I soloed a lot in Yosemite, and never had an issue). My friend could never bring himself to feel sorry or contrite

about the effect of the accident his actions caused years before, and our friendship ended after an incident where he got in a shouting match with climbers on the Nutcracker (John Bachar and I were also there at Ranger Rock, but we opted for a harder and less traveled route to solo), and I refused to take his side on the ethics of passing slower parties. For some, being right trumps being contrite, it seems.

So back to Underhill—the privileged Harvardeducated guy whose views were probably common among many thought-leaders in the era of global rising fascism and damaging 'scientific' notions of eugenics (e.g. Nobel-laureate William Shockley)—is complicit because as a respected leader, who was known to privately express the need to exclude a generalised group of people, is he complicit in the tragedies of humankind that arose from such attitudes. That is the current view of the American Alpine Club, as even his public silence is considered complicit (Jamie Logan of the AAC responded quickly and appropriately). And as Brad Rassler points out in the Outside article, Underhill's antisemitic views which he still expressed in 1946 are inexcusable marginalized generalizations, as the racial extermination practices in Europe had been discovered after the Soviets moved through Poland in 1945 and uncovered some of the worst atrocities that took place. At some point, the connection between words and events needs to be awknowledged, then shared and expressed by positive thought leaders.

Then there is Miriam O'Brien, who was one of the best climbers of the 1920s, who married Robert Underhill-- is she complicit too, and implicated in the shameful bias? She once noted Hitler as a "great" in her memoirs, but it might have been in a facetious context (as no one thought Hitler as great in 1956, did they?), and no other indication of her views on such matters is evident.⁷⁹ Miriam brought a huge amount of

⁷⁹ Sallie Greenwood clarifies (2022): "Miriam and Hitler: the only reference is to Bob sharing an elevator with Hitler in 1932 and that she translated a conversation between Mussolini and her father in 1924, and that 'This is not the only contact with the 'great' that our family has had.'-- Miriam Underhill, Give Me the Hills (1956), p. 41. So her idea of Hitler being great was definitely facetious."

respect to women's climbing. Should that balance any doubt? Her name is being removed from the AAC award as well.

Paul Pritchard asked me the other day, "What if one day there is incontrovertible proof eating sentient beings is seen as barbaric in the same realm as cannibalism?" and that all past meat eaters will be wholly condemned. Certainly possible, but for now, there is no excuse for generalized attitudes that can so obviously lead to harm to human life and shared liberty. My best explanation to my children is always to remember that diversity is the most important value we have as a society, all great civilizations began with diversity, and that throughout history, discrimination and generalizations always lead to worse outcomes to all but a few. And to recognize that unconscious bias is everywhere and is probably inherent in human nature, and "woke" just means to try to be aware of our personal biases (my mother, a devout Christian, would often remind me growing up, the concept of Matthew 7:3 "Why do you see the speck in your neighbour's eye, but do not notice the log in your own eye?").

Like in all things, there is probably a middle path to be found—something distinct from 'culture wars' involving whitewashing history (an interesting study is the Tasmanian History Wars of the 1980s), or full dénouements and erasures of the past. Perhaps "truth-telling" (the title of Henry Reynolds latest book) describes the middle path. These are things I think about every time I open an old classic reference or translate an online journal on the development of climbing—what was the context of the achievement or attempt? But it is important to also look for the

motivations of people in the past—some were looking for glory, some were looking for a spiritual experience, some primarily interested in the engineering challenge of vertical ascent and rescue, all pursued within the same activity of climbing rocks with all its games climbers play. So with the researched revelations of Underhill's mindset, his contributions are considered in this light, as the grey often involves both good and bad ideas for the table.

In a way, it is a choice we all have—would we rather have our persona be remembered or our ideas? Personally, outside of close friends or family, the ideas choice seems better, especially if those ideas have the potential to make the world a better place. So it only makes sense to be open and share positive ideas—perhaps some good ones will filter out into the wild.

So back to the 1920s Americana Big Wall Climbing History Research—ciao for now. John Middendorf, Hobart, Tasmania (August 11, 2022). 80

⁸⁰ (as posted) ps., this post has been about processing thoughts as I creep ever-closer to role of a historian (distinct from the theoretical role of a researcher, which I prefer), so when I go into the more cut-and-dried engineering history of big wall tools and techniques, I can focus on the developments rather than what was considered the big news, and perhaps resist the historian's temptation to promote or demote one's favourite individuals as a researcher of the history of climbing. There are plenty of books like that with all flavors of heroes, so please, dear reader, let me know if I fall into any of those pitfalls as I write about all the amazing early USA climbers who were 'getting after it' on the early North American big walls. The lines are what inspire—as only an occasional climber these days, it is still natural to gaze at every cliff or vertical expanse, and not wonder which route would be the most elegant and possible, even though my skills are far behind me to climb such things.

COMMENT FROM MAURICE ISSERMAN

Helpful to my questions about these matters, Maurice Isserman, author of an important historical view of American Mountaineering: Continental Divide (2016). Maurice provided me with broader view on the matter of "fallen heros", with succinct interpretation with concrete examples which makes the path forward more clear as a writer of history:

As someone teaching US history to undergraduates, I am always wrestling with the issue of fallen heroes. Unavoidable. Our founding Declaration of Independence begins with the observation that all men are created equal. Coming from a slaveowner, who bought and sold men, women, and children throughout his life, and freed very few of them (and those tending to be blood relations) Thomas Jefferson is a problematic founding father, to say the least. Of course, Jefferson was, at the same time, a man of the enlightenment, a defender of religious tolerance, and -- by the standards of the 18th century -- a radical egalitarian. And subsequent generations of more genuinely radical thinkers – suffragists, abolitionists, and others – would adopt and give new and deeper meaning to Jefferson's understanding of natural law and human equality.

We can't overlook Jefferson's flaws, excusing them because "he was a product of his times" -- because others of that time, including close personal friends of his like the Polish military engineer Thaddeus Kosciuszko, who made a singular contribution to American victory in its war for independence, was very anti-slavery, and hoped to win Jefferson to his point of view.

Thinking about the past, we have to accept contradiction, without excusing evil. Jefferson, like the country he founded, combined good and evil traits, wisdom and folly, tolerance and prejudice, and he was hardly alone in that. We also need to bear in mind that future generations will undoubtedly look back on people of our own times as equally benighted, for our meat-eating, our carbon fuel burning, and who knows what other behaviors and beliefs whose evil we are blind to today.

I don't think there's a general rule for dealing with flawed ancestors. I'm in favor of taking down all the monuments to Confederate generals, because they represent treason in defense of slavery. I'm not in favor of tearing down the Jefferson memorial or Monticello, because Jefferson stood for some admirable principles, and made a critical contribution to the American Revolution, and to the spread of democratic principles in his own time and in years following his death. We should, however, say what

needs to be said, about his terrible shortcomings. Similarly, the Sierra Club, of which I'm a member, should continue to honor John Muir as a founder, a mountaineer, and an environmentalist, while noting his blind spots regarding Native Americans in his vision of wilderness preservation. And Planned Parenthood, of which I am a supporter, should continue to honor Margaret Sanger, as a founder, advocate of reproductive rights (also a socialist, which is often forgotten), but note her wanderings into the racist and nativist thickets associated with the eugenics movement in later years. And so on.

Robert Underhill's case, in the current controversy surrounding the prize which, until this year, the American Alpine Club awarded in his name, is a little different. He wasn't a founder of the AAC, or even closely identified with the organization (as he was with the Appalachian Mountain Club.) The Underhill award was of relatively recent invention. In this case, renaming the award, and foregoing any continuing association with his memory and legacy (which, unfortunately means ditching Miriam as well, since a Miriam Underhill award would merely remind everyone of her now unmentioned husband) seems to me the right and proper thing to do.

By the way, while I'm on the topic of Underhill, I suspect there are other, as yet undiscovered examples of his unworthiness as an honored climbing ancestor. Both times when I came across his anti-semitic musings, first in the AAC library in Colorado, and second in Berkeley's Bancroft library, I wasn't even trying to find materials related to him; there just happened to be a letter from him speaking ill of James Ramsey Ullman in the Henry Hall papers at the AAC, and then another letter speaking ill of a Jewish climber who died of a climbing accident in Dick Leonard's papers in the Sierra Club archive at Berkeley. He obviously didn't have any hesitation expressing his anti-semitic views to various friends and acquaintances, without feeling any shame in doing so. I wonder how many other such letters -- unexploded ordnance, as it were -- lay buried in various other archives, as yet undisturbed, but ready to blow up again and again in years to come.

--Maurice Isserman

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Author Note: These last five pages have been included as it has all been part of my research while developing my own understanding of how history has been written and celebrated (or not).

Example peak (re)naming, 1929-1941.

Trails and Timberline report (1929):

"Carl Blaurock, Stephen H. Hart and W. F. Ervin made the first ascent of "Mt. Lindbergh," an attractive prong on a western spur of the Continental Divide above Monarch Lake, on September 2nd.

Robert Ormes in the AAJ (1941):

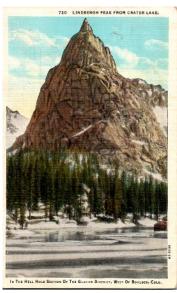
"LONE EAGLE PEAK, formerly called Lindbergh, lies in the head of a valley above Monarch Lake, near Granby, Colo. It is a curiosity among mountains, for though unquestionably one of the most imposing peaks in the state."

A case in point is the summit known by mountaineers as Mt. Lindbergh or Lindbergh Peak, in honor of Charles Lindbergh's aviation accomplishments (first solo transatlantic flight, 1927). Lindbergh Peak is site of some of the earliest technical routes in North America. and was a sought after objective. By 1941, it was only known as Lone Eagle Peak (his nickname), a period when Lindbergh became controversial for isolationist and other views. There was also the question of naming a geographical feature for a living person.81



Lindbergh Peak in the Dwight Garrigues Lavender Collection, University of Colorado Boulder





1939 postcard: "Named in honor of the flying hero Lindbergh Peak rises perpendicularly nearly 2000 feet from its base in Crater Lake. It lies in the midst of "The Hell Hole Country".

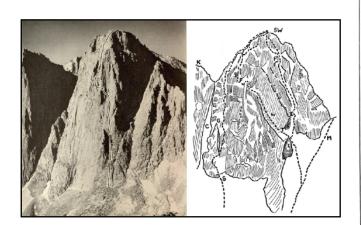


Date unknown (Jennifer Runyon, U.S. Board Geographic Names)

⁸¹ In 1906 the rule was: "Names of living persons should be applied very rarely, and only those of great eminence should be thus honored"; in 1951, the "living persons" policy became stricter, and by 1974 the rule became firm. Starting in 1939, hostility between Lindbergh and Roosevelt in the public arena divided the nation on both domestic and international affairs leading up to WW2 (Duffy, 2010). USGS records reveal a debate on the name within the Rocky Mountain Forest Service district, but in 1929 the Acting Forester withdrew support for the naming of the peak, and it remained unnamed by the U.S. Geographic Board in 1933. Lone Eagle Peak first appears on USGS maps in the 1958/1960 edition, and in 1961 the name 'Lone Eagle' was approved Federal use. In 1981, after Lindbergh's death, there was effort to change the name to Lindbergh Peak but it was unsuccessful (Jennifer Runyon email correspondence, 2023).

Early engineered rock climbing in California, 1934 (Richard Leonard)

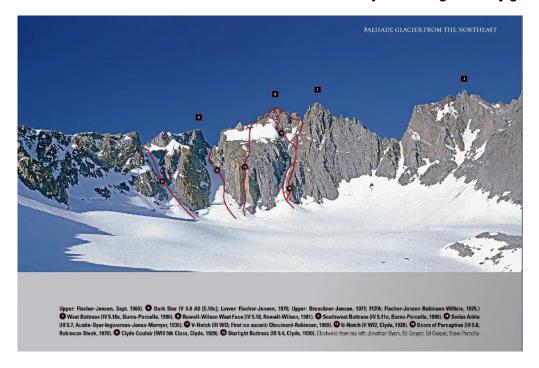
The origins of safer rock climbing in America.



Mount Whitney from the East. Left: Fifty Classic Climbs of North America, Steve Roper and Allen Steck, 1979. Right: Topo from A Climber's Guide to the High Sierra, Hervey H. Voge 1954. The point 'F' marks the Fresh Air Traverse.



Map of Mt. Whitney area, from A Climber's Guide to the High Sierra, Hervey H. Voge 1954. Creating maps with more detail relevant to climbing than offered by the USGS was a major challenge of early guidebooks.



Another impressive Norman Clyde route: #15 Starlight Buttress, 1930, climbed without pitons. Photo from Doug Robinson's fine Alpinist #48 article on the Palisades (2014), used with permission from Doug, who writes, "Certainly the hardest thing climbed in that cirque at the time!"

USA adoption of pitons 1920s-1939--Part C: California, 1934.

Creative Imagining:

It's sometimes said, "The best climbers are the ones having the most fun." But climbing hard routes is often sparse with 'fun' – most of the fun comes later. Perhaps the best climbers are the ones having the most... realized creative imagination. Creative Imagination is a well-established study of psychology, often awkwardly defined in terms of divergent and analytical thinking, and a vaguely defined "intuitive" process (pure "as-if-from-God" inspiration has never been well defined by psychologists). Artists have it all the time. Pablo Picasso once said, "What one does is what counts, and not what one had the intention of doing." In other words, creative imagination only exists if realized by the oft-uncharted doing of a thing. In climbing, the 'doing' is often packed with suffering, hardship, and flashes of brilliance; later all these moments merge to become the 'fun'.

America 1930s Climbing

Since the days of Whymper, the initial creative imagining of standing on high summits dwindled in potential in 1930s America, with most significant points of prominence either ascended or noted as only imaginarily climbable. Expeditionary high mountains were still the main focus among the alpine clubs, and tall majestic rock walls such as the Diamond on Long's Peak were still considered impossible. A modern form of creative imagining expands. involving the increasingly efficient use of tools to ascend "lines" up ever-steeper tall expanses of rock. Three epicenters of creative rock climbing emerged in America as the new tools were incorporated: the East Coast, Colorado, and California, each with



Starry Night by Vincent Van Gogh. Some acts of Creative Imagination are not recognized at the time and might even be considered madness.

their own imaginings of the possible on steep vertical rock, and all contributing prototypes for later imagined and climbed bigwalls.

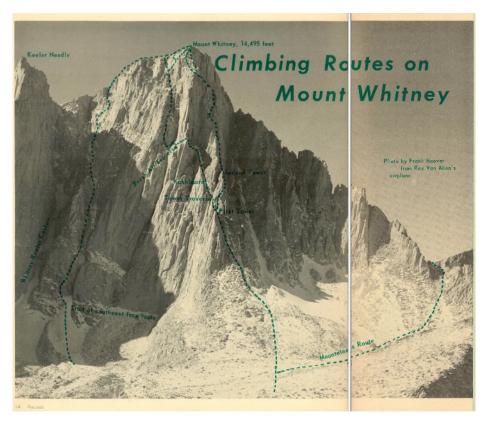
Yosemite, 1934

In climbing's progression of reducing the risk of falling, nowhere did the transition to efficient piton-protected climbing evolve as fast as in Yosemite, thanks to a young group of climbers from the Cragmont Climbing Club, who first mastered their technical skills on a pile of scattered boulders in the Berkeley hills of California. Led by a young lawyer from Ohio, Richard M. Leonard, the club was to change the game dramatically by introducing a studied engineering approach to the tools of climbing. Founded in March, 1932, the club set out to prove a better way of climbing, first by theory, then by practice, and finally by setting new standards in American climbing.

Background on Yosemite Valley rock climbing:

Before its first recorded ascent in 1886, Grizzly Peak had been considered the last 'unclimbed summit' in Yosemite. Majestic tall towers of stone in Yosemite Valley—the Cathedral Spires, Split Pinnacle, Pulpit Rock, The Arrowhead and Lost Arrow—were named and admired. but not yet conceived as potential summits for a mountain climber.82 In the 1920s in the Sierra Nevada mountains. Norman Clyde became legendary for his hundreds of first ascents of intricate lines, many soloadventures, on the major peaks. The game then was to climb the mountains from the cardinal directions, and

Clyde often discovered new routes to climb, for example, the challenge of the east wall of Mount Whitney, the highest mountain in the contiguous USA, was noted as "Whitney from the East."



The original Whitney from the East route climbed in 1931 took the line with the "Fresh Air Traverse", described as "Minimum Class 5, 100 feet. Traverse left (S) around a large rectangular ledge, cross a gap in the ledge requiring a long step, and work out about 20 feet to the left." (Summit 1960). Class 5 was defined in the 1937 Sierra Club Bulletin as "Severe. Pitons should be available on the climb."

Occasional pitons 1927-1933

By the early 1930s, more routes were made possible with the occasional use of a piton, such as the one that protected the exposed "Fresh Air Traverse" on Whitney from the East, first climbed in 1931 by Clyde, Jules

⁸² Footnote: As Richard Leonard reflected in 1934, many of these towers of rock "had been considered totally impossible. Things like the Cathedral Spires nobody even considered, because they knew you couldn't climb those." Also, Grizzly Peak wasn't really the last peak to be ascended in 1886, as many smaller remote summits were ascended in the High Sierra for decades hence; the peak was named after the Grizzly Bear (North American Brown Bear), once prevalent in that region but extirpated in 1922, when the last one was hunted and shot in the foothills of the Sierras. Elsewhere in 1931, climbs up peaks like the Devil's Thumb in Alaska were starting to become envisioned, though it was not climbed until 1946 when Fred Beckey, Clifford Schmidtke and Bob Craig ascended via the east ridge; the peaks were noted as the "remarkable granitic spires of the Devil's Paw and the Devil's Thumb. This range may yet be found to contain some of the most difficult climbing peaks in North America." (AAJ 1931).

Eichorn, Glen Dawson and visiting East Coast climber Robert Underhill, who shared his knowledge of the European climbing systems of climbing with artificial anchors. The ascent was by no means the hardest rock climb in the Sierras but effectively gave a green light to some of the younger members of the Sierra Club to begin using the "specialized technique" that was enabling a whole new genre of wild climbs in America. In the early 1930s, pitons had been useful on other climbs in the Sierras, as well as for 'Rope-Down Routes' over peaks and passes between sub-ranges in the Sierra Nevada.⁸³

Snapshot 1933—elsewhere, and information flow

In 1933, American climbers were using pitons more widely but had not yet caught on to all the techniques that had evolved for three decades since the early days of <u>Tita Piaz</u> in Europe, but the art was changing fast in North America. The Europeans by this time were testing the extreme limits of pitons on many of the bigwalls in the High Alps and the Dolomites, from the alpine achievement using a lightweight kit of pitons, carabiners, and slings on the north



A sampling of the books likely circulating among some American climbers in the 1930s. Each of these books describes piton-protected climbing techniques in detail.

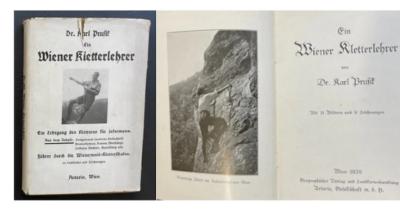
83 footnote: Rappel routes were then known as 'rope-down routes'. For example, (SCB 1937): Rope-Down Routes. Fourth to fifth class; 200-foot reserve rope required. By the use of many pitons nearly any route is probably possible. It is well, however, to mention certain routes that have actually been used. On July 25, 1934, Glen Dawson and Jack Riegelhuth reached Slide Canyon from the NW. arête of the West Tooth near the junction with the Sawblade by a series of four rope-downs involving the use of one piton. At the same time Doris F. Leonard and Richard M. Leonard roped down from the West Tooth toward the Middle Tooth by Route I and thence by three more rope-downs along the SE. buttress to Slide Canyon. The last rope-down, from a piton on a ledge, was 105 feet, most of it over-hanging. On July 7, 1934, Kenneth May and Howard Twining worked out a successful route roping down from the Middle Tooth to Slide Canyon by the great SE. chimney from the East Notch. On September 7, 1936, Carl Jensen, Bestor Robinson and Richard M. Leonard roped down from the Middle Tooth to the N. base by roping off from the lower end of the chimney on the NW. face the upper part of which forms a portion of Route 3. About half of the last rope-down is overhanging. On September 8, 1936, John Poindexter and Don Woods roped down the N. face of the East Tooth from the East Notch. The route is very severe, involving the use of pitons and slings to sit in as one of the intermediate stances. The route involves considerable uncertainty and is not recommended. In the 1954 A Climber's Guide to the High Sierra (ed. Hervey Voge), these same routes are upgraded to Class 5 to 6 and noted as "Rappel Routes," the same term we use today. For more on evidence of wider spread piton use in North America beginning around 1927, see these posts on the Colorado and East Coast climbers. By 1933, the 1932 American Alpine Journal feature on the new tools by Max Strumia was beginning to bore fruit with adherents adopting the new tools.

wall of the <u>Matterhorn</u> in 1931, to the heavily-equipped feats of vertical endurance such as the direct route on <u>Cima Grande</u> in 1933.

In short, in Europe by 1933, piton-protected climbing had developed into a fine art with broad disciplines and evolved specialized tools, with clear concise instructional texts widely available. Along with European-made equipment brought back from climbers frequenting the Alps (and increasingly shipped from catalog suppliers), many of these texts would have also been circulating

among American climbers, in addition to tools and technique articles appearing more frequently in the American and Canadian journals. The information was all there, but in the period between 1927-1933, North Americans were deliberating their own appropriate adaptation of the new tools.

In terms of technical expertise by 1933, routes in Colorado, Wyoming, and Canada involved more advanced use of alpine pitons than on the coasts of North America, with more technical rock routes in high alpine ranges like the San Juans; difficult testpieces like Lizard Head Peak were increasing in popularity. Perhaps due to the cowboy heritage of the Rockies (consider the many names for slings: cinch, lash rope, tie-down, short-rope, etc.), and the nature of the climbing, the Colorado climbers were more adept at incorporating slings as part of the running belay on pitches with multiple points of protection, something that appears to have eluded the Californians, and probably also the East Coast climbers, until the later-1930s.84



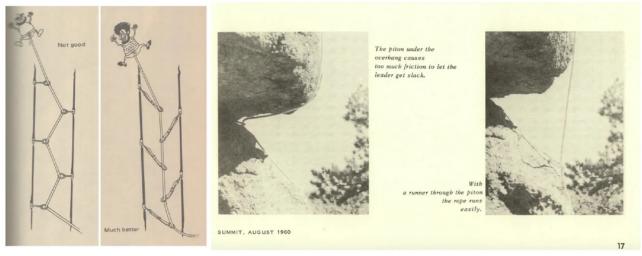
Karl Prusik wrote a book on techniques in 1929 and listed six basic techniques that should be formally taught to every beginner climber: knots, belaying, rappelling, hauling a pack, creating an anchor with pitons, and making a tension traverse (Seilquergang), see Volume 1 more details on Prusik.

⁸⁴ Footnote: Though Franz Nieberl's "Das Klettern im Fels" series (first published 1911, updated every few years to 1966) would have been one of the more popular climbing introduction books in Eastern Europe, with tens of thousands of books printed, the Karl Prusik (1929) and Leo Maduschka (1932) texts seem to be more referenced in early English (and French) journals. Richard Leonard reports in Belaying the Leader (1946) that by 1934, the Leo Maduschka 1931 treatise had been translated into several languages, describing in detail with profuse illustrations, 'the new piton technique of Europe.' In terms of climbing experience, Fritz Wiessner, who in 1925 climbed some of the world's technically hardest "Grade VI" bigwall routes (SE wall Fleischbank with Roland Rossi-noted by Rudatis as using the "extensive use of nails" - and La Furchetta with Emil Solleder), once he moved to America in 1929, he became a proponent of pitons exclusively for security, and not for direct aid. Wiessner was also a masterful gearprotected free climber with his experience in the Elbsandsteingebirge, and had also climbed to 23,000' on Nanga Parbat in 1932; he later advocated for pitons for the K2 attempts in the later 1930s, so his views on artificial aid and the appropriate use of pitons within the American community were also influential. More on Wiessner later. Interestingly, Richard Leonard even in the 1970's believed the horizontal and vertical piton designs we use today were invented by 'a German by the name of Dülfer a few years before' 1932, even though Dülfer had died in 1915. The American version of the 'Dülfersitz' as a body rappel method was becoming standard around this time in America.





1932 Sporthaus Schuster catalog, noted in 1932 North American journals as a source for mail order pitons. Right: the ASMü piton designs imported into the USA in this era (Marty Karabin Collection). Both pear-shaped and strong oval carabiners were available by this time.



Back to the future—Sling expóses, 1960s (left: Robbins, Advanced Rockcraft, right: Off Belay magazine). In the 1930s, using slings (often called 'rope rings' as a direct translation from the German references) was well-known as a way to tie off a flake or as rappel anchors, but the idea of using them to extend points of protection in a running belay with additional carabiners seems to have eluded many climbers in the 1930s, as indicated by the many stories of horrendous rope drag on climbs with multiple pitons (and even lead techniques of using two ropes so one belay rope could be abandoned when the rope drag rendered it useless). It is an interesting regression, as rope rings (slings) were the main way to connect a rope to a running rope system using pitons in Europe in the days prior to karabiners—see Piaz chapters. Of course, having lots of extra carabiners was still rare, and typical racks had many more pitons (of various sizes) than carabiners.

Style and Ethics evolve in North America

Just as the debate over appropriate climbing tools had raged in the British journals in the prior decades, around this time, we see more writings in American iournals either defending or attacking the use of hardware on rock climbs. Increasingly few argued against using pitons for security (as a belay), while the leading purists oft reiterated the timeless argument that with enough technology, anything could be ascended, as this period was also a golden era of professional rock engineers such as the 'high-scalers' who famously built the Hoover Dam at high risk (over 96 people died in its construction). Richard Leonard wrote in 1934: "George D. Abraham, one of the leaders of British climbers, said that it is not sporting to use pitons though it's all right for climbers who are professional who are doing it for pay; but an amateur climber should do it for sport and not protect himself."



High-Scalers at work on the Hoover dam in 1932 (USBR). Rarely did professional rock engineers put themselves in a position where a dynamic fall could occur, yet many of their maneuvers on rope required advanced rock climbing skills.

So unlike in Europe, where increasing reliance on tools in the mountains had undergone a steady progression since the 1900s leading to the heavy aid routes that were all the rage in the Eastern Alps in the early 1930s, the Americans were initially more conservative in adopting the pure aid techniques that would later enable great climbs such as El Capitan from the southeast and southwest. Using pitons as hand- or foot-holds was still highly frowned upon, and the normal progression would be to first attempt an objective without hardware, and if deemed necessary, a minimal set of tools would be collected and applied on the next attempt. At the same time, imaginative climbers were seeing new potential and possibilities of systematically using the piton, rope, and carabiner system as a way to minimize risk on complex steep lines on the stone on the challenges in America, using a combination of free and aid techniques.85

ROPE UNDERSTANDINGS to 1933

Increased reliance on fixed hardware in the rope system added a new dimension to the engineering aspects of climbing, yet it was not until the 1930s that important properties of ropes were better understood by many climbers; namely, the elongation and energy-absorption properties. Articles reviewing ropes focused on the external aspects, such as suppleness and handling characteristics when wet, with a minimum breaking strength recommendations of at least 750kg. This usually translated to a well-made manila or hemp rope, with quality source fibers and yarns, twisted lay, about 12mm in diameter. A typical kit for rock climbs included a 100-foot (30m) 12mm rope, and a 200-foot (60m) 10mm rope for

⁸⁵ Footnote: from here on, 'Aid' refers to using artificial tools as a means to directly gain upward ascent, in contrast to only using hands, feet, and other body parts as connections to the rock while ascending ('Free'). Prior to the 1930s, 'Artificial' (and thus 'aid') referred to any use of pitons in the mountains, even if only used for 'security' (the German word for 'security' can also be translated as 'insurance', i.e. insurance in case of a fall).

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11/4 "	2.565 " " "	3900 "	3500 "
11/2 "	3.204 " " "	5000 "	4000 "
2 "	6.47 " " "	7600 "	7300 "

It was a rope light and strong, as the above table indicates, smooth and flexible — a rope of a very superior quality that filled a great need at an opportune time.

Specifications for the woven linen yacht rope recommended for climbing by Dwight Lavender. Note size indicates the circumference of the rope. A 1 1/4" circumference rope was the equivalent to a 10.1mm rope.

rappels. As seen from the chart from a 1934 French instructional below, silk ropes were also available, though at much higher cost, but if not well made would not be significantly stronger than the less expensive manila or hemp ropes (for more details of rope fibres, yarns, and method of manufacture, see Volume 1).86

Dwight Lavender in Colorado promoted a woven linen rope made for yachting, a well-made rope from the Plymouth Cordage Company, which had test strengths that exceeded hemp and manila, and likely had improved elongation properties due to its woven construction, but linen flax as a rope material was not as robust as hemp or manila with heavy use and is more

susceptible to UV damage; woven ropes in general, though better handling, did not hold up to the rigors of climbing as well as 3-ply twisted ropes, and were generally not as strong.⁸⁷



The time Threid Company expensed their willingness to do all they could in the matter of spinning the threid. Through their codpension is satisfactory threed was produced, and the Planach Coolage Company was able with the great nearber and variety of rope machines at their command to manufacture it into a tope of the secondaries of the manufacture it into a tope of the second to case the command to manufacture it into a tope of the second to the contract of the contract to the contract to

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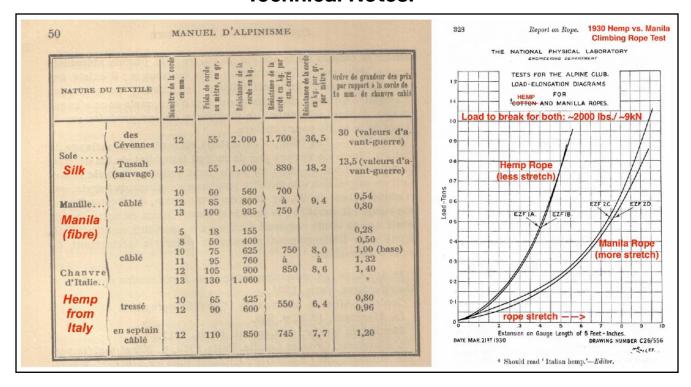
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The quality of the fibres and yarns were essential for a good rope. Plymouth obtained many of its yarns from the Linen Thread Company in the 1930s.

⁸⁶ Footnote: The nomenclature for the natural source fibers was muddled in this period. Confusion over the fiber material abounded—often we see terms like "Manila Hemp" and "Sisal Hemp", even though the hemp fiber was a different plant altogether from manila or sisal. Also, one Italian Hemp rope was not always the same as another. Italian Hemp was an imported product in its raw material form, and the strength and quality of rope highly depended on first the yarn-making, and then the rope-making production process, with many cheaply made ropes on offer—hence the minimum strength requirement from a reputable supplier. Debates on the benefits of a "right-handed" or "left-handed" lay also entertained equipment aficionados.

⁸⁷ Footnote: The Pymouth Cordage Company was the main supplier of climbing ropes in the USA from the 1930s-1970s, including the famous 3-ply nylon Goldline.

Technical Notes:



Left: Rope engineering data from Manuel D'Alpinisme, 1934. Silk ropes suitable for climbing purposes were also made in southern France by 1934 (as well as Japan). Silk ropes were the first dynamic climbing ropes prior to nylon, but were 10-15x more expensive than the more common Italian Hemp ropes. The fourth column allows you to compare the relative strength of fibre based on size and type of construction. For a given diameter, three-ply laid (câblé) ropes for manila are weaker than Italian hemp, but had better elongation properties (not shown on this comparison chart). Note that France also had a sizable silk industry dating back to the 15th century.

Right: tests made in 1930 on two rope brands: Frost Italian hemp rope and Beale manila rope. The slightly stronger Frost rope, used on Everest, was the clear choice of the reviewers, and the manufacturer of the Frost rope wrote, "As a further comment we should like to draw attention to the fact that the elongation of our rope compared with Beale's when a load of 0.2 tons has been placed on the ropes is much less, and in our opinion, this is of some importance, as it would tend to prove that Beale's rope is of a more spongy nature than ours." The following year S.B. Donkin corrected the misunderstanding, writing, "This statement suggests to the reader that a rope having a minimum of stretch is the better rope. It is this interpretation which I wish to correct, because the reverse is true. Engineers know that a rope which has the greatest stretch must be the safer rope to use." (Hemp ropes stretch about 10% at break, manila about 16%). Despite Donkin's note and the important data collected in 1930, it still took years for climbers to note the significance of the elongation properties of ropes. In the Italian Rivista Mensile, for example, perhaps with a more vested interest in Italian hemp, concurred that the 1930 tests proved the superiority of the "Italian hemp ropes are both stronger and far more suitable for mountaineers than manilla". Even in a 1950 comprehensive report "The Climbing Rope Defined" in the Alpine Journal, the link between stretch (elongation) and energy absorption does not seem well understood. In the USA in 1950, Arnold Wexler published. The Theory of Belaying in the American Alpine Journal, a mathematical treatise on the engineering properties of rope systems that clarified the science of both natural and nylon ropes, a developing science in the preceding decades in America.

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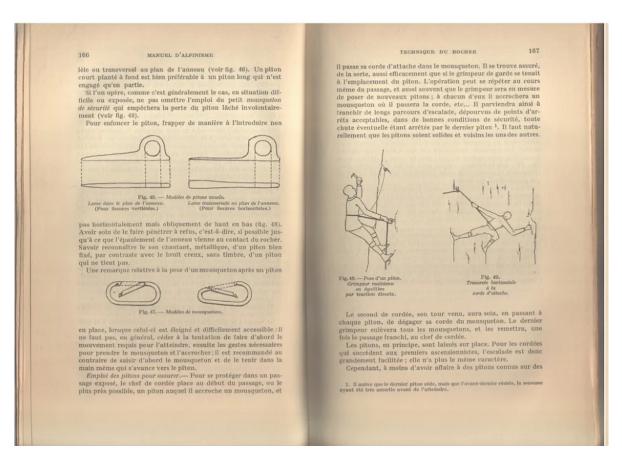


Plymouth Cordage was the largest supplier of climbing ropes in the USA from 1930s-1970s. They also made the first American nylon ropes: "The Quartermaster Corps had been testing natural-fiber ropes when it received a new sample from the largest rope manufacturing company in the world: Massachusetts' Plymouth Cordage Company. Plymouth had been making large-diameter nylon ropes for sawmills, and provided the Corps with smaller-diameter rope for climbing." (correspondence with Christian Beckwith). Their Goldline (with the nylon dyed gold) nylon 3-ply twisted rope was the standard climbing rope of the 1970s.

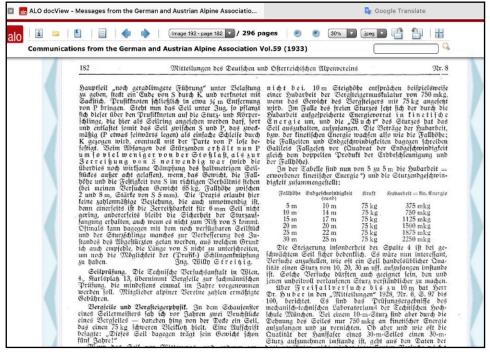




Silk rope production in China. A single cocoon could provide 900m of silk thread. In the early 20th century, Japan, France, and India were also significant silk fibre producers.



By 1934, the French were publishing technique books describing modern piton-rope systems, with an engineering approach to equipment. Pages from the 1934 Manuel D'Alpinisme, Vol 2. Descriptions for pitons explicitly warn against the use of the original L-shaped Mauerhaken.



Left: An early reference to the rope's energy absorption properties in the German literature (1933). Fall factor (the length of the fall divided by the amount of rope in the system to absorb energy) was still a distant concept in terms of understanding rope mechanics, but this article noted the total length of the rope. The carrying strap should be 2" in width and should draw upward from the under side of the top brace; the strap should be so shaped or attached to the brace, as to cause the straps to leave the point of suspension at an angle of from 20 to 25 degrees from each other. For lashing, a piece of hemp rope, [4" in diameter and from 25" to 30" in length, has been found most satisfactory in use. For a pack cover, a piece of lightweight, tough, waterproof canvas (shelter-half) about 5"x 7" serves very well and provides,

waterproof can vas (shelter-hall) about 5' x 7' serves very well and provides, also, a good ground-cloth when not in use as a cover.

Upon this pack cover compactly build up the pack, making the bundle of a size, at the bottom, about 27' to 30' long by 15' wide and of any necessary depth. This done, the next step is to fold the pack cover saugly over the duffle, set the bundle on the carrier and firmly lash it in place. Very little

duffle, set the bundle on the carrier and firmly lash it in place. Very little experience is required to learn how to make up a sung, firm, smooth pack which will not easily work loose. Space does not permit a more detailed description of how the pack is lashed to the carrier, etc., but the method may be clear from the sketch (Fig. B).

The principal advantages found in this type of pack are these: it has lightness in weight combined with great strength; it rides easily, is sung and cool, and may be thrown off quickly in an emergency; it is not necessary to remove the pack when sitting down to rest, for the bottom of the carrier will then set turn up the ground and lift the strays from the shoulders hard irrethen rest upon the ground and lift the straps from the shoulders, hard, irregular bundles do not reach the body; maps, toilet articles, etc., may be carried between the staves and the back of the pack where they are easily reached without removing the pack; and the lashings provide a convenient means for carrying one's axe.

means for carrying one's axe.

The principal disadvantage appears to lie in the fact that in order to remove an article from within the pack it is necessary to loosen the lashings and lay the pack open, but one soon becomes accustomed to doing this and it may be accomplished with no great degree of trouble and with but little loss of time. On the other hand, with the pack open, no blind fumbling is required to find the article sought, nor is it necessary to disturb seriously the position of other articles in the pack.

Aliced H. Poloschu. Alfred H. Edgerly

HOLDING THE ROPE.—The most efficient attack of an alpine peak, and HOLDING THE ROSE.—The most efficient attack of an alpine peak, and the safest, is made by a party of mountaineers roped together. It is possible while elimbing difficult courses on rock to make use from time to time of belays. Often, however, in rock climbing, the assurance of assistance must be given by using the body as a belay. The body is always the desirable snubbing post for the rope and the rock or tree belay should reinforce the security or steadiness of the belayer.

The general practice in the past for the rock elimbers around Boston has been to employ some such form of shoulder belay as is illustrated in Fig. 1. In its essentials, one stands with feet firmly braced, one foot being advanced. It is this extended leg which prevents over-turning by a sudden pull and gives the major resistance against slipping. The rope from below should come up on the same side as this advanced leg and as nearly as possible in

VARIOUS NOTES

hands (Fig. 2). It can be anchored, or played in or cut as before. The advantages of this method are that:—

(a) the rope is always in line with the extended leg:
(b) only the lower part of the body is baded!;
(c) the rope is anchored close to the center of gravity of the man, and therefore the tendency to overturn is reduced.

The disadvantage is that the rope makes a greater angle with the vertical and the greater side-pull tends to cause shpping.

It may well be of interest to compare mathematically these two methods of holding the rope, as has been done by Mr. George S. Bower in an article in the Ruckszich Clab Journal! Mr. Bower has considered only friction and the possibility of slipping, but the tendency to overturn due to a sudden pull is of equal if not greater importance. A slip is not probable, as one assumes in belaying the best stance possible; mailed boots or rubber soles on ordinary rough rock should give friction concept to prevent slipping.

Definite dimensions will be considered for the discussion. Let us assume the belayer to be a man six feet high, whose center of gravity, or hips, is three feet up, and whose shoulders are five feet up. He stands with one leg advanced in a straight line, the foot being two feet in front of his center of gravity. This extended foot is two feet from the edge of the vertical clift. The climber below weights 150 pounds and comes on the rope creating a rope pull of 150 pounds. What must the belayer weigh? What force must his leg resist and what is the necessary frietion to prevent slipping.

It will be assumed that the helayer is at the point of being pulled over and is pivoting about the forward foot with no weight on the rearone.

Hip Belay.—The forces acting on the man (Fig. 3) are his weight, W, the rope pull of 150 pounds, and the pressure, P, between his foot and the rock ledge. Since he must not turn about his advanced foot the sum of the moments, or turning tendencies, about that foot of all the forces acting on the man should total zero. Thus:

 $150 \times 1.2 - 2W = 0$

Therefore, W = 90 pounds, or a man weighing more than 90 pounds will not overturn in this position.

1927, pp. 1-14. "Climbing Mechanics."



line with it. The rope passes under the armpit and over the opposite shoulder. One hand grips the rope as it comes up and the other after it comes over the shoulder. It is possible to anchor securely by grasping both parts of the loop about the body with both hands, or one can play the rope in or out as the man below ascends or descends. The advantages claimed

- for this method of holding are that:—

 (a) the pull to be resisted is nearly in line with the body, especially if one leans back;

 - pecially if one leans back;
 (b) the pull is more nearly vertical than if the rope is held lower down, so the side-pull which tends to cause a slip is lessened;
 (c) one can resist a sudden slip below by leaning back and putting the strength of the back into play (this resistance is intensified if one stands with knees slightly bent and can stiffen with a surpine as the null consult.

temsified if one stands with knees slightly bent and can stiffen
with a spring as the pull comes);
(d) it is elaimed that one can even lift the man below by crouching slightly, keeping the rope taut, and then straightening up.
The disadvantage is that the pull is anchored at the shoulders, high up on
the body, with a considerable tendency to overturn it. This tendency is
greater if the rope first passes over, instead of under, the forward shoulder.
Other climbers favor holding the rope above the hips, as did Mr. Hassler
Whitney at the recent rock climbers' meeting. Mr. Geoffrey W. Young
also says, "The most comfortable position, on a free or anchored stance, is
to pass the rope around the body just above the hips."
The rope comes up
by the extended leg, and passing around the body, is gripped by both ¹ From Ernet Ensensperger, Bernsteigen (Berlin, Weidmannsche Buchhandlung), p. 224.
² Mosmain Croft, p. 225.

EQUIPMENT AND TECHNIQUE

Since the vertical forces should balance, and also the horizontal, the vertical component, N, of the pressure on his foot must equal 180 pounds, and the horizontal component, Fr, or friction, 120 pounds. The pressure, P, equals 210 pounds and acts in line with his leg through his center of gravity.

The man must weigh at least 90 pounds.

His advanced leg must be able to withstand 210 pounds.

The coefficient of friction between his foot and the rock must be at least $\frac{120}{180} =$ 0.67. This is a reasonable value for nailed boots or rubber soles on

Shoulds Belay.—(A) The man stands erect (Fig. 4). The forces are the same as before, but the rope pull is anchored at his shoulder. Since the overturning tendency about his extended foot should be balanced:

 $150 \times 1.57 - 2W = 0$ Therefore, W = 118 pounds, and the man should weigh at least 118 pounds. The vertical component, N, equals 236 pounds and the friction on the foot is 94 pounds. The pressure, P, on his foot equals 233 pounds and does not act in line with his leg. Therefore, the leg muscles must withstand a tendency to bend his leg as well as the greater pressure.

and a tensor.

The man must weigh at least 118 pounds.

His advanced leg must resist 253 pounds, and bending.

The minimum coefficient of friction between his boot and the rock is re-

duced and equals $\frac{94}{236}$ or 0.40. (B) The man leans back (Fig. 5), so that his body is in line with his ex-

(B) The man leans back (Fig. 5), so that his body is in line with his extended leg.

If overturning is just balanced:
150 x 1.37−2W = 0
and W = 103 pounds. Also N = 204 pounds and Friction = 111 pounds. The total pressure, P, on his foot equals 235 pounds and acts as shown. Summary:
250 pounds must weigh at least 105 pounds.

The man must weigh at least 103 pounds.

His advanced leg must withstand 232 pounds and bending.

The minimum coefficient of friction is $\frac{111}{204} = 0.54$.

These numerical results only apply to this position and a rope pull of 150 pounds. They should be proportionately increased for a beavier man. Conclusion:

For anchorage against overturning the hip belay is superior.

For anchorage against overturning the hip belay is superior.
For anchorage against sliping the shoulder belay is better.
The hip belay seems to be the better type to use, because friction should only be of importance when the belayer is on smooth elabo are a downward sloping ledge. No belay should be attempted on ice unless one's mails grip, or erampons are worn, or suitable steps have been cut to hold the feet and guarantee friction enough to prevent slipping.

Dean Peabody, Jr.

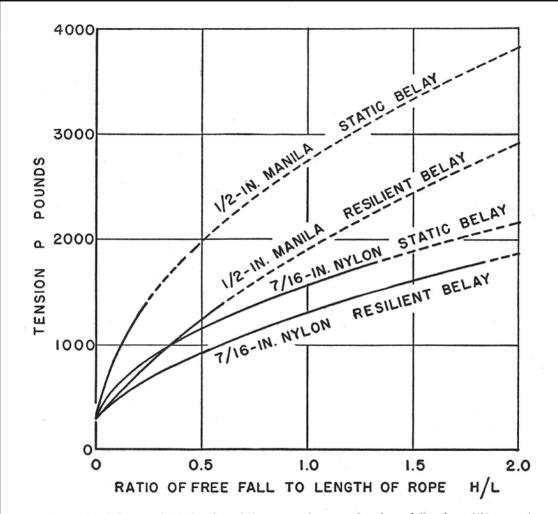


Fig. 2. The tension developed in rope due to the free fall of a 150-pound man for various ratios of free fall to length of rope, H/L, for the static and resilient belays.

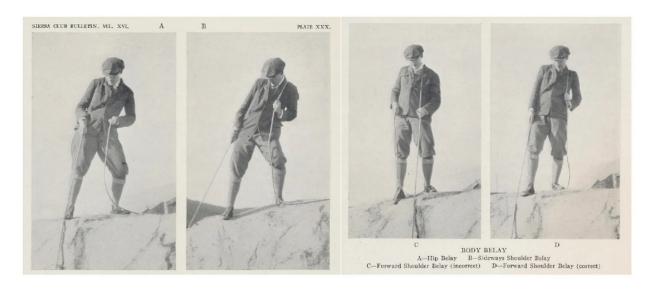
The modern rope understanding that was to develop in California--From Wexler's Theory of Belaying (1950-still one of the best introductions on rope physics), showing that the nylon rope, even with a static belay, resulted in less load (tension) during a high fall factor (H/L) fall that the dynamic (resilient) belay with a natural fibre rope, thanks to greater rope-stretch. Here, too, we see the influence of Richard Leonard, Bill House wrote in 1946: "The almost incredible performance of some of the synthetic fibers suggested an investigation there. Under the able direction of Richard Leonard work was undertaken in cooperation with the Plymouth Cordage Company, and tests were made of many different types, consistencies and lays of nylon rope. With no exceptions the final choice of medium lay bright nylon was found to be superior to the highest grades of Manila. Chief and foremost was its great resistance to shock. It was found to absorb over three times the shock loading as the same weight of Manila. As an example, the best grades of Manila could be stretched only to approximately 13% of their length before breakage, whereas the nylon rope would stretch over 39%. In addition to this most important safeguard for the mountaineer, resistance to abrasion was found far greater than in Manila, although the first few hours' use resulted in a frayed appearance which some early testers thought was premature wear. Holding capacity of knots in relation to strength of rope was found better than Manila and moisture absorption was far less."

The leader must not fall

Every climber understood, in theory, the huge shock loads of a falling climber, thanks to many stories within the climbing community of a climber's rope snapping (or getting cut over an edge) during a dynamic fall. But in 1933, there was very little understanding of the rope's ability to absorb some of the energy of a fall, and many reviewers considered a rope's 'sponginess' a detractor, even though it generally meant less impact load on the belayer and the climber in the case of a fall. The "indirect belay" coined by Geoffrey Winthrop Young in Mountain Craft simply recommended using the human body and grip to resist the forces of the fall rather than quickly tying the rope off to a fixed anchor, though in some cases the latter was considered appropriate if the leader was deemed reckless and could pull the whole party from the cliff, in which case a 'direct belay' (a fixed anchorperhaps the rope wrapped around a natural rock bollard) resulting in a broken rope and a dead leader was preferable to the whole

party going down. That was about the extent of the knowledge of dissipating the energy of a shock load for most climbers and climbing instructional book authors in 1933.

The recommended high-center-of-gravity shoulder and high-hip belay methods would be difficult to catch a long fall without getting pulled uncontrollably from a perchthe main reason piton anchors became acceptable with climbers risking longer falls, even though the solid anchor increased the chances of rope breakage. Some climbers, such as Miriam O'Brien, did understand that some slippage of the rope was desired when catching a fall, but how to best control slippage (and how much) is not an easy skill to master, and no specific methods are offered in the period's instructional literature. So with all these factors, the climbing community simply reiterated, as if a mantra, "the leader must not fall." That is, until Richard Leonard came along in 1933.



Underhill's recommended belay methods in ON THE USE AND MANAGEMENT OF THE ROPE IN ROCK WORK, 1931 Sierra Club Bulletin. Note the ungloved hands—creating a controlled slippage with these methods is difficult. A seven-foot fall was the practical limit of this type of belay, according to Richard Leonard.



Richard M. Leonard 1965

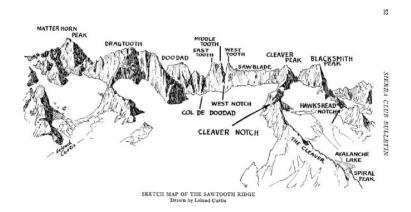
Photograph by Doris Leonard, Bridge & Leonard



Newton B. Drury and Richard M. Leonard immediately following their election by the Council of the Save-the-Redwoods League as, respectively, Chairman of the Board and President of the League, August 28, 1975.

Photograph by David Swanlund

Happy guy during a long career in realized creative imagining in climbing and environmentalism.



The Three Teeth (11,750)

Route 1. Traverre northwest to routheast. Class 4; rappel cope required. First ascent July 2, 1933, by Henry Beers, Bestor Robinson, and Richard M. Leonard. (See "Three Teeth of Sawnoth Ridge," OSe, 1934, 1-33.) The route is up a series of ledges in a broad depression on the center of the northeast face of the West Teoth. Several variations are possible at the start. About one-third off the way up, aversee disponally upward to the right (SW) to less difficult ledges leading upward to the sawblade. Follow the artic back to the left (SE) to the tumed been atthe summit book. Climb to the northwest out of the tunnel, and then up the northwest face of the block to the summit of the West Tooth.

From a point at the southeast end of the tunnel rappel 75 feet toward the Middle Tooth to a 3-foot ledge. Climb downward toward Shide Caryon 100 feet along steepily slipping ledges and cracks. Traverse back anotheast to the West Neich, Ascend a chamsay rising from the notch toward the summit of the Middle Tooth, Follow this chinney about Zoo feet until easier face climbing purposen on the left (VSb). Traverse this Too diagnosity right (Sb), cross the chinney about 50 feet below the summit, and then by good holds on the face to the right of the chinney climbs to the summit of the Middle Tooth.

The route down to the Bast Notch follows a short chimney near the northeast end of the summit, then steep rancks to the head of the large chimney a short distance below the notch on the Silde Canyon side. Thereare southnear 15 feet along ledges on the Silde Canyon face of the Bast Teech to a narrow steep chimney up the face. Climb the chimney to a chockstone, then traverse to the right (SE) a few feet to small holds out of the chimney to a parallel crack. Follow this crack to the summit of the East Teeth.

From the summit follow the Slide Canyon side of the southeast arête down over steep, exposed and very difficult climbing. About half-way down this arête a pinnacle about 20 feet high will be encountered. This can be passed by direct attack and a rappel down a steep chimney on the opposite (SE), aide to less difficult climbing leading to the Col de Doodal. A better route is to turn right at the Pinnacle and descend the southwest face over progressively easier climbing to the Slide Canyon base of the Middle Tooth.

Early climbs of Richard Leonard, The Three Teeth of the Sawtooth Ridge (1933, illustrated here from the northeast): "some of the most difficult climbing in the high country." Route description from A Climber's Guide to the High Sierra (ed. Hervey Voge, 1954).

Enter Richard Leonard (1908-1993)

In 1933, the Sierra Club's conservative "board of directors did not approve of rock climbing because they thought it was dangerous." (Richard M. Leonard, Mountaineer, Lawyer, Environmentalist, Volume I, 1975). And it was. Without a surefire way to keep people safe in case of a fall, leading anything more than about ten feet above an anchor was essentially soloing, with the vague knowledge that someone below might catch a long fall, but at worst they won't also plummet to the deck if anchored securely into a piton.

Leonard quickly realized the standard methods of belaying were more theoretical than practical, suitable only for short falls—perhaps a couple of meters at best. For every doubling of fall length, the energy is squared; in other words, a ten-foot fall would result in a quadrupling of forces compared to a five-foot fall. Leonard reflects on the 1933 situation:

"The European philosophy was that nobody could hold the fall of a leader. To put it another way, if you are climbing a mountain and you have an experienced person who leads the climb, he has a rope to the second man and the third man. Even if they do not have experience, the second and third are protected. But if the first man, the leader, should fall, say, twenty feet, he would fall twenty feet down to where the second climber was and then another twenty feet below him. If

the second climber were on a ledge, that would be forty feet before anything could be done about it. To my logical, legal mind that did not seem sensible because it meant that if that one person fell, all three would be killed." (ibid, Volume 1, 1975).

And indeed, both in Europe and in America in this era, a forty-foot (12m) fall on steep rock in the mountains often resulted in tragedy, with accident reports in the international journals full of morbid tales of double falls, snapping of pitons, and rope failure on big mountain walls.⁸⁸

The creative imagining of Leonard

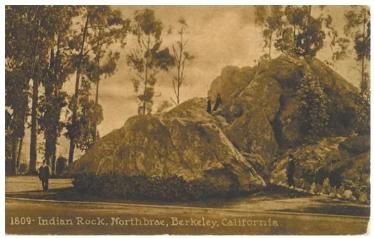
Leonard "felt very sincerely that no one should ever have to risk his life climbing." and notes, "Some of the German climbers, in their publications, had stated that it was perfectly proper to risk life for a major climb. We did not think so." (Volume 1, 1975). His early experience on difficult High Sierra routes helped him envision the next step in American climbing; namely, the extensive top rope practice of climbs "beyond the present ability of the climber" to safely gain confidence in the limits of athletic ability. and "the systematic practice of falls and belays." Compare Leonard's ideas to the contemporaneous wisdom of *only* climbing within your ability, and that 'the leader must not fall'.

⁸⁸ Footnote: For example, the tragic death of Toni Schmid in 1932, whose belayer could not catch his fall, and they both plummeted down the face of the Grosse Wiesbachhorn (his partner, Ernst Krebs, survived but was badly injured). The American Alpine Journal noted, "The summer of 1931 was a most disastrous one for climbing." Most deaths were weather-related but long falls were also often to blame. The AAJ article also noted the death of a solo climber in Zion (Don Orcutt on Cathedral Mountain, which did get a lot of press in the general news, as he had just made an early successful ascent of the Great White Throne), and concludes, "Nevertheless, as time goes on, the tragic losses of mountaineering appear to be getting relatively insignificant. Last season, the press reported over two score deaths in football and twenty killed and one hundred and one wounded during the hunting season in New York State alone." Regarding piton attitudes among Sierra Club members, no articles or information about the safe usage of the new tools appear in the Sierra Club Bulletin until 1934 (unlike the American Alpine Club which had been describing piton-protected climbs since 1930, and the AMC since 1928).

And so in 1933, at age 25, Leonard and his friends organized the Cragmont Climbing Club to begin the systematic practice of 'upper belay' climbing (now called top-roping) in the crags around Berkeley, where he had recently completed a law degree at the University of California in 1932 and was beginning his law practice in the San Francisco Bay Area, later becoming one of the greatest champions of the preservation of America's great wild lands, leading a long series of American environmentalists that understood the importance of the legal process in accomplishing an environmental objective.

Among Leonard's early partners for the freefalls were the older Bestor Robinson (35 years old), and the younger and athletic Jules Eichorn (21 years old). [author note: I like to include their ages because many of these climbers had long careers, and were still climbing in the 1970s, so never seemed young to our young eyes].

Improving on the idea of an "indirect belay", the free-fallers theorized that there would be an optimal amount of slippage, based on the length of the fall, so the fall could come to a halt with precise control, and most importantly that even for the longest falls, with a loading force never exceeding the strength of the rope. The technique was combined with more secure body belay methods (under the belayer's center of gravity, using their mass to begin the deceleration). They also understood the engineering principle of extending the time

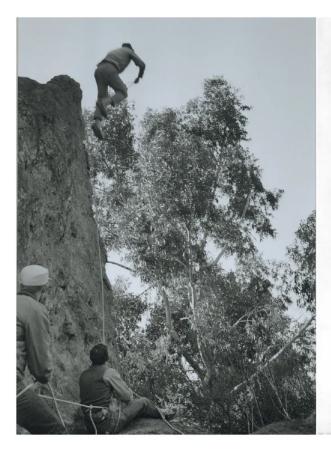


Leonard's first rope jumps were at Cragmont Rock Park, but the overhangs at nearby Indian Rock became a preferred place to practice lead falls. The Sierra Club President, Duncan McDuffie, donated the land to the City of Berkeley in 1917. Awesome history by Steve Roper at https://www.cragmontclimbingclub.org/ history.

to absorb the energy of the fall, and that the additional time translated into adding to the falling distance. And that the only way to prove this, and develop new techniques, was to become part of a human experiment.

The early 'systematic practice of falls and belays', documented in Leonard's article "Values to be Derived from Local Rock Climbing" (June, 1934, Sierra Club Bulletin), Leonard and his cohorts extended their safety zone to ten-foot free falls, with a sitting hip belay. By October of 1934, they were achieving 18'-20' falls, which would have been unprecedentedly intentional falling on the low-stretch natural fibre ropes of the day.⁸⁹

⁸⁹ footnote: Tests with fixed anchors and body-weight sandbags, the same ropes would break during a six-foot fall (FF=1). Climbers in the Elbsandsteingebirge were also testing the limits of rope falls during this time on routes with solid artificial anchors. It was also about the limit of impact force the human body could withstand without damage, so simply having stronger ropes was not the answer. At some point, I hope to relate the rope jumping stories and pioneering with longer jumps on the Parrotts Ferry Bridge and the jump spot on El Cap in the 1980s, as we also had a learning curve in greater magnitudes of impact forces (coincidentally, our ratio was calculated to be 1/3 as well—tc).





Early American rope jumping by the Cragmont Climbing Club/Rock Climbing Section of Sierra Club, 1933+. Note the rope under the butt—but still called a hip belay—this method was novel and allowed the belayer's body weight to absorb the initial load, leading to the 'dynamic belay' method with controlled braking—see notes on engineering principles. Courtesy Yosemite Climbing Association and Museum.

Bigger Whippers

As Leonard and his fellow free fallers perfected the technique, the rule of thumb of the amount of rope to let slide around your body/hand frictional system, with a graduated braking force, became a ratio of between 1/3 and 2/3 the length of the freefall, depending on fall factor. So, a '20-foot fall' would involve freefall for 20 feet, and perhaps another 10 feet of deceleration, for a 30-foot ride total. For long pitches, plenty of rope was saved for the potentially required long deceleration, so with a 120' rope, a long rope in those days (36m), meant that the maximum length of a safe pitch

could not exceed 80-feet, in case a 40-foot deceleration would be required.

Arnold Wexler later developed a complete mathematical engineering proof of the new ideas, which became known as the 'dynamic belay', an improved and quantified belay method that fulfilled the technological need to do the hardest climbs with a minimum of risk, in the last decade prior to nylon climbing ropes.

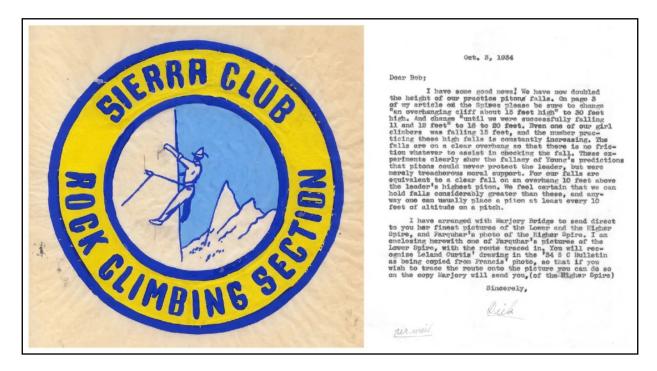
Leonard writes, "These experiments clearly show the fallacy of Young's predictions that pitons could never protect the leader, but were merely treacherous moral support. For our falls are equivalent to a clear fall on an overhang 10 feet above the leader's highest piton, We feel certain that we can hold falls considerably greater than these, and anyway one can usually place a piton at least every 10 feet of altitude on a pitch." 90

- 1. Easy. Rock-climbing experience unnecessary. Examples: Whitney, Alta Peak, Dana, Conness, Clouds Rest.
- 2. Moderate. Ropes should be available on the climb. Examples: Russell, North Palisade, Ritter, Lyell, Clark.
- 3. Difficult. Ropes should be used in all cases—continuous climbing. Examples: Black Kaweah, Middle Palisade, Clyde's Minaret, Half Dome from Mirror Lake.
- 4. Very Difficult. Belays should be used—consecutive climbing. Examples: East face of Whitney, Echo Ridge, Three Teeth.
- 5. Severe. Pitons should be available on the climb. Examples: Washington Column, Panorama Cliff, Lower Cathedral Spire, Higher Cathedral Spire.
- 6. Very Severe. More difficult than fifth class. As yet undefined. Examples: None as yet.

California gradings in 1938.

⁹⁰ FOOTNOTE (tech st

⁹⁰ FOOTNOTE (tech stuff): Fall factor (FF) then only known as H/L-the freefall distance divided by total length of the rope between the belayer and the climber. As Arnold Wexler later showed mathematically, in theory and in tests, only a fall factor 0.25 could be held with a static belay (or a poorly performed 'indirect belay'). In Arnold Wexler's excellent engineering and mathematical analysis, published in the 1950 AAJ as "The Theory of Belaying" quantified the fall factor and calculated the ideal braking force and distances of deceleration. Initially, the recommendation was to let about the same amount of rope out as the length of the fall, but Wexler (who called it the 'resilient belay' in contrast to a static belay) later did a complete mathematical analysis and determined that with 4 times the climber's weight, i.e. about 600lbs frictional body belay sliding methods, with between and 1/3 H and 2/3H required for deceleration. Nylon ropes, with greater elongation, eliminated most of the need for additional deceleration, and with the next evolution of harnesses and metal "belayers", belays got largely static for a while (except for the dynamic rope). Today we have the 'soft catch' methods, using variable friction belay devices like GriGri which allow much more deft control of the belay device unlike the 'stitcht plate'-type designs (tc in 70s-80s gear talk). On Arnold Wexler in the AAJ, 1998: "He was one of a group of rock climbers that pioneered climbing in the Washington, D.C. area in the 1940s. When this group became the Mountaineering Section of the Potomac Appalachian Trail Club, Arnold served as its Chairman for five or six years, quietly leading it through its formative stage. Through his testing of ropes and climbing equipment at the National Bureau of Standards during WW II, Arnold met a west coast climber, (then Major) Richard Leonard. Together they made the first mathematical analysis of the forces on a falling climber, his anchors, the rope, and the belayer. They created the idea of dynamic belaying a progressive snubbing of the rope around the belayer's body to mitigate the shock on the system. At Carderock, a local climbing area, Arnold encouraged the practice of dynamic belaying by using "Oscar," a 150-pound dummy, who could be dropped to simulate a falling climber. The ability to do a dynamic belay undermined the prevailing ethic that the leader should never fall because of the usual fatal consequences. Now the system need not fail. This was the first step toward today's new climbing ethic."



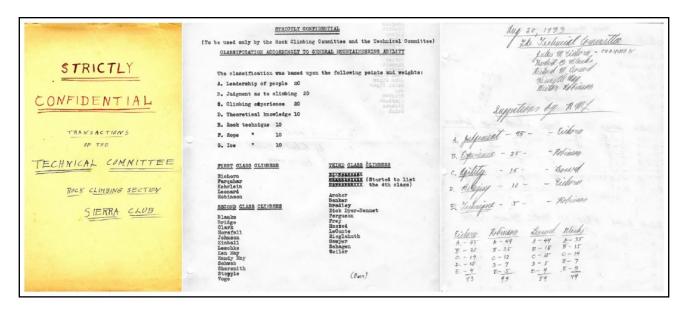
Left: pin design for the newly formed Sierra Club's Rock Climbing Section (1934), when the club finally thawed to accept rock climbing with pitons. Right: letter from Richard Leonard to Robert Underhill who edited his "Piton Technique on the Cathedral Spires" in the AMC journal.

Sierra Club Relents

Seeing this measured approach to climbing, the Sierra Club board shifted direction from the "tradition of John Muir" members such as William Colby (who believed in keeping ropes and gear to a minimum in the mountains), to the more progressive leadership of Francis Farquhar (who became president in 1933), whereupon the recommendations of the 1932 Committee on Rock Climbing were accepted, and

Leonard became chairman of the Rock Climbing Section of San Francisco Sierra Club chapter, which became simply known as the RCS and the Cragmont Climbing Club was abolished. In 1933, the RCS of the San Francisco chapter of the Sierra Club had over 50 members, all learning how to fall, belay, and rappel safely, and with great fun and excitement, meeting often in the rocks above Berkeley and around the Bay Area.⁹¹

⁹¹ Footnote: Other Sierra Club chapters followed suit setting up technical rock climbing sections, and there were many RCS's, even in other clubs. Glen Dawson from southern California was also learning the new methods and was an early member of the Sierra Club's Southern California Sierra Club Chapter's RCS. The sections were progressive with balanced genders—notable early women members include Marjory Bridge, Ruth Dyar, Barbara Welch, Doris Cocoran (who married Richard Leonard), Virginia Greever, and Jean Husted: some were signed off on 15'/25' roped falls, and were climbing early repeats of the hardest routes being established in this period. The Yodeler was a popular newsletter with all the gossip and new climbs, and many strong partnerships formed. For more on the social dynamics, see Pilgrims of the Vertical by Joesph Taylor (2010—he does not get the 1980s quite right but the 1930s Sierra Club research is in-depth). A partial list of prolific first ascensionists spawned in this period and later: Glen Dawson, Richard Leonard, Jules Eichorn, Morgan Harris, L. Bruce Meyer, Hervey Voge, Kenneth Adam, and David Brower (18 Yosemite first ascents, 12 with Harris), Jack Arnold, Raffi Bedayan, Fritz Lippman...



Grading notebook pages on RCS members, rating their judgment, leadership, climbing experience, theoretical knowledge, rock and rope technique, and other weighted factors (which were adjusted frequently). First Class climbers in 1934 included Jules Eichorn, Francis Farquhar, Oliver Kehrlein, Richard Leonard, and Bestor Robinson.

As more climbers gained experience with the new methods, the RCS created a system of points for potential Yosemite leaders—all very scientific, as was their approach to safety. Members of the RCS had to prove their ability to both fall, and catch a fall, to be considered a qualified leader. Leonard reckons only 30 or 40 people were climbing at a high level in the 1930s in Yosemite, but the systems they developed would initiate a long history of global export of more efficient bigwall techniques initially developed on the walls of Yosemite Valley.

Impossible climbs made visible

In April, 1934, the RCS created a list of Yosemite rock climbs, along with potential climbs that might be possible with the new tools and techniques—some of these had been attempted, and many rated 'E' for 'Extra Severe—pitons needed for safety',

and some rated 'F' for 'immoral—pitons needed for direct aid'. Both Higher and Lower Cathedral Spire were rated E/F, and Leonard, Eichorn, and Robinson were the first to make an attempt in 1933.



On left, the Lower Cathedral Spire and Higher Cathedral Spire (named in 1862) from John Williams, Yosemite and its High Sierra, 1914

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A FEW ROCK CLIMBS AROUND THE YOSEMITE VALLEY
                                                                                                           A FEW CLIMBS IN THE YOSEMITE VALLEY (con)
          wiled April 1934 for the use of the members of the
& Climbing Section of the Sierra Club of California
Richard Leonard and Kenneth May.
                                                                                              #17. Arroyo Pinnacle-BG-(2)
  The list is intended to be a rough indication of climbing localities, routes which most obviously "need" climbing, rather than exhaustive list. Starting from near El Capitan, the Valley walls are followed in clockwise direction. The number of known ascents is shown in brackets. The symbol, #, indicates that section member is somewhat acquainted with the climb, The following scheme is used in classifying the climbs according to difficultys (Rhpes should be taken except for A climbs)
                                                                                              #18. Mirror Lake to Diving Board-C-(2)
                                                                                              #19. Mt. Starr King-DbyN.E.-CbyS.E.-(nev)
                                                                                              #20. Illilouette Canyon-CD-(2)
                                                                                              #21. Grizzly Peak by M. Gully-C-(4)
           - Enay - a good burrougouldade it.
- Moderate - too hard for a burro, too easy for ropes.
- Difficult - all but the expert need ropes.
- Severs - ropes needed in all cases.
- Extra Severs - pitons needed for asfety.
- Immoral - pitons needed for direct aid.
                                                                                               22. Panoramie Cliff-DE-(0)
                                                                                               23. Sentinel Rock from below-DE-(0)
                                                                                               24. Fissures-CDE-(0)
  1. N.W. Gully of El Capitan-GD-(1)
                                                                                             #25. Highest Cathedral Spire-E, parts F-(+)
  2. W. Gully of El Capitan-D?-(0)
  3. Arrête between 1 4 2-D9-(0)
                                                                                             $26. Lower Cathedral Spire-EF-(2)
   4. Crack Ate on E. face of E.C .- EF-(0)
                                                                                               27. Lesser Cathedral Spires-DEF-(0)
  5. Lower Brother by W. face-C-(0)
                                                                                             #28. Higher Cathedral Rock by central Gully-D-(2)
  6. Middle Brother-BO-(E?)
                                                                                             $29. Lower Cathedral Rock by lower gully-CD-(3)
  7. Eagle Peak by S.E. face-DE-(0)
                                                                                               30. Lower Cathedral Rock by N.W. face-CD-(0)
#8. Castle Cliffs-C,D, or dep on rts-(1)
 #9. Royal Arches-C.D.orn dep on ht-(0)
                                                                                               31. Crocker Pt. from below-?-(0)
#10. Tashington's Column-BoE-(4)
                                                                                               32. Dewey Pt. from below-?-(0)
11. Tenaya Canyon-AgorCDdep on rte-(sev)
                                                                                               33. Stanford Pt. from below-?-(0)
12. Clouds Rest by N.V. face-D-(0)
                                                                                              34. Cliffs farther down the Valley, the Gateway, etc.
13. The Arroyo-D-(0)
#14. Half Dome from Mirror/Lake-BC-(3)
                                                                                              There are of course an almost infinite number of additional courses or routes without any objective.
15. Half Dome By S.W. face-E-(+)
16. Half Dome near the gable (2 rtes)-DE-(37)
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List of potential climbs in Yosemite, 1934. Sierra Club RCS notebooks. Both "Highest Cathedral Spire—E, parts F" and Lower Cathedral Spire (EF) were noted as 1/2 climbed, as attempts.

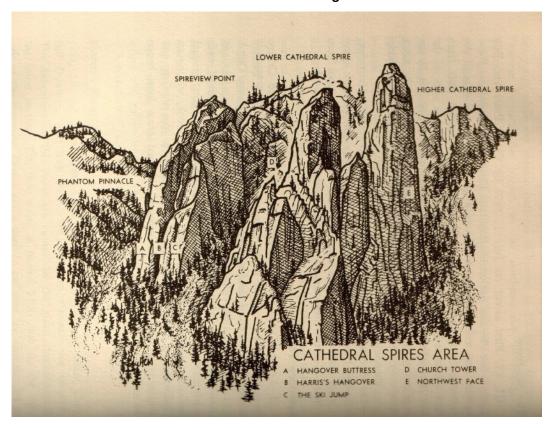
After a few attempts and ascents in Yosemite using common hardware as piton anchors (e.g. 10" hardwarestore nails—which did not provide much security), the RCS crew had mastered the technique, but still needed the tools: so Leonard over the winter of 1933 made two orders of the most modern equipment from Sporthaus Schuster in Munich, which by this time had globally circulated classic catalogs (filled with information as well as product) and were known as a reputable international supplier of the best new climbing tools. And in the spring of 1934, they set out for the impossible climbs.



Leonard's notebooks of early climbs and the famous 10" nail retrieved from Washington Column in 1936 in the Yosemite Climbing Association's collection. Leonard had originally placed the 10" nail as a piton in 1933.



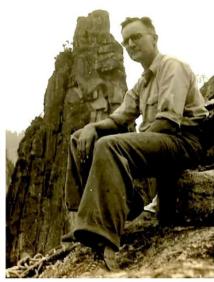
Typical early rock hammer with a wrist loop and sharp pick used in the 1930s. Chipping holds in flakes, and using the sharp point to "enlarge cracks too small to take the point of a piton" (1938 Trail and Timberline) were still common and accepted practices in the 1930s climbing. These hammers were often modified geologists' hammers. Right: Actual rope used by Jules Eichorn in 1930s Yosemite at the Yosemite Climbing Association collection.



From Steve Roper's 1964 Yosemite Guide ('the red guide'). Many of Yosemite's early climbing breakthroughs took place in the Cathedral Spires area.







Leonard, Eichorn, and Robinson in the early 1930s. On the Cathedral Spires, Leonard was a strong leader and strategist, young Eichorn the rope-gun, and the older Robinson the "belayer par excellence ... a strong rope team of three." (Eichorn, AAJ1994).

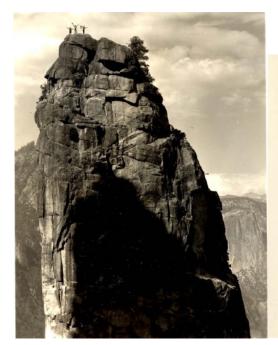
Creative Imagining Realised

Starting first with the creative imagining of climbing of Higher Spire, then new techniques practiced and perfected, and finally all the tools gathered, it was time for the ascent of the 'Highest Cathedral Spire'. Richard Leonard, Jules Eichorn, and Bestor Robinson set off with 500 feet of rope, 13 carabiners, and 55 pitons of various sizes. The climb required several forays, but on April 15, 1934, in ten hours of climbing from the notch, they were standing on the summit of the taller of the two towers of stone—the largest free-standing granite formations in California. Their climb involved 800 feet of free-climbing and 10 feet of direct aid (later freed at 5.9+). The elegance of their threeperson team's ascent, much of the risk averted by technical skill, and exposed difficult climbing amidst 'dizzingly overhanging' features, (SCB, June, 1934), Leonard reflects, "So that started rock climbing in the western United States." (ibid Volume 1, 1975).

The safer methods, "changed the whole philosophy of climbing," Leonard said, "If we got up to a point where we were not quite sure we could hold a fall if it occurred, we stopped and turned back. We weren't embarrassed, and we weren't cowardly. We just thought we were sensible." With this same philosophy, they further raised the technical bar with an ascent of the Lower Cathedral spire, a climb not as long, but harder, and at the upper limits of their minimize-risk philosophy.



More graded climbers from the RCS notebooks.

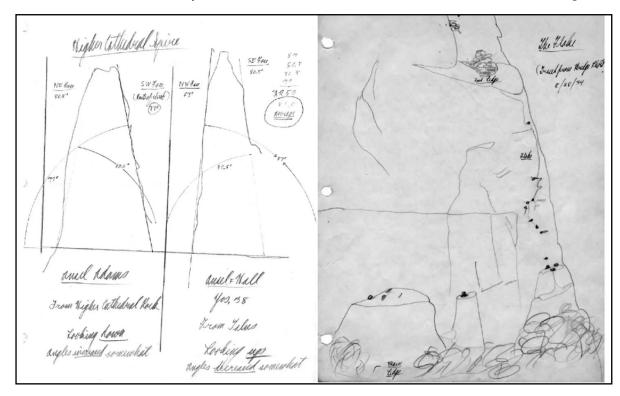




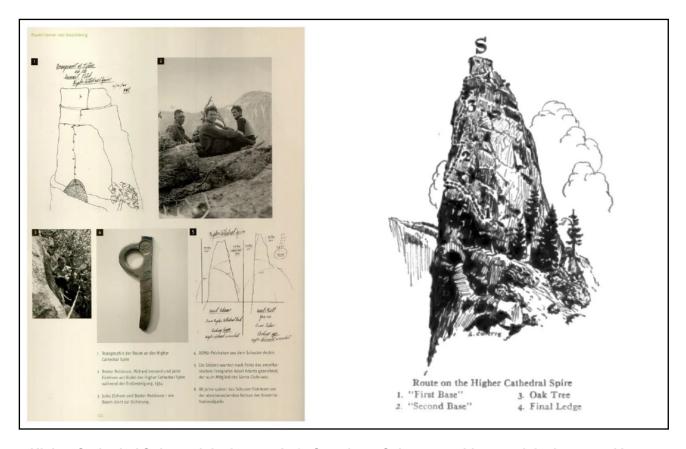
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Left: The team signalling on Higher Cathedral Spire [Richard M. Leonard photograph collection of rock climbing techniques, The Bancroft Library, University of California, Berkeley.] Right: Topo from George Meyers Yosemite Climbs, 1982.

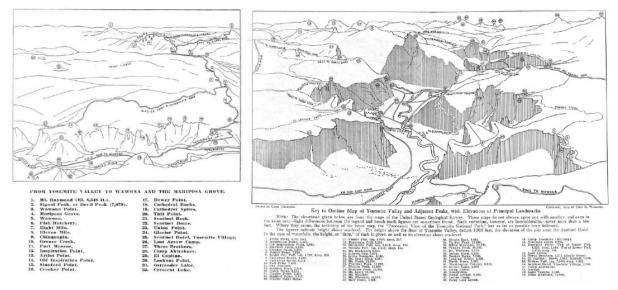
1972 Meyers guide to Yosemite, note pitons still standard equipment even though the 'clean revolution' on free climbs was in full swing.

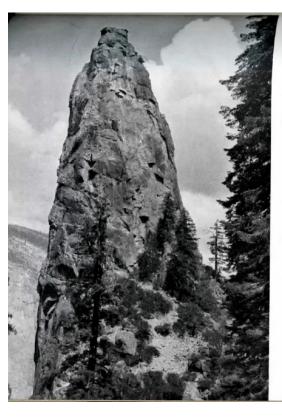


more original topos of the Cathedral Spire climbs. Yosemite Climbing Association Library.



Higher Cathedral Spires original topos. Left: Sporthaus Schuster archives—original topo and image of the steel Fiechtlhaken shipped to the California climbers in 1933/4, in reference to their contributions to the great climbs of Yosemite (Flori Schuster, 100 years of Sporthaus Schuster, 2013). Right: Route map from Bestor Robinson's excellent trip report in the June 1934 Sierra Club Bulletin, where his lists the equipment: "Two half-inch ropes (120 feet long, tensile strength 2650 pounds); 200 feet of roping-down line (tensile strength 1000 pounds);60 feet of extra rope, for slings; 55 pitons, assorted; 13 carabiners; two piton-hammers, with slings attached; three piton step-slings; extra clothing; first-aid kit; two small cameras; one motion-picture camera; and lunch."





HIGHER
CATHEDRAL SPIRE
Route of ascent is
up this face, at left

Photo by Francis P. Farquhar



LOWER
CATHEDRAL SPIRE
With route of ascent
marked at right
Photo by

Marjory Bridge

VALUES TO BE DERIVED FROM LOCAL ROCK-CLIMBING BY RICHARD M. LEONARD¹

THE local activities of the Rock-Climbing Section of the San francisco Bay Chapter of the Sierra Club differ from those of other rock-climbing groups of which I have knowledge, in three important particulars, namely: The use of an upper belay; climbing upon problems considerably beyond the present ability of the climber; and the systematic practice of falls and belays.

Safety is of course the prime justification for requiring the use of the upper belay. Like the Harvard Mountaineering Club, we can point to a record free from accidents to support this policy. It enables those who have never climbed before to make their mistakes and learn their lessons without danger to themselves or others. It also allows the more experienced to climb upon problems considerably beyond their present ability. With the limited length of our local climbs (averaging from 25 to 75 feet), we feel that it is only by climbing very close to or beyond our normal standard that we are able to materially raise that standard. Of course, when climbing somewhat beyond normal ability, anyone, even the most expert, will fall occasionally, so that it is only with an upper belay that one is justified in attempting this type of climbing. Now, we have found that falling, in and of itself, provides certain values that usually are not perceived. One who climbs without having fallen several times never realizes how close, dangerously close, he may frequently have come to falling, without actually doing so. Nor, on the other hand, does he often realize just how much more he could have safely accomplished had he known more exactly the limits of his ability. But one protected by an upper belay is able, after several falls, to come to a pretty close estimate of the narrow dividing-line between safety and danger. He realizes more accurately than he could otherwise just what causes his falls and just how far he can go without falling. It is true that the expert in the light of his long experience is able to come to just as accurate an estimate without such training, but for the inexperienced, without an upper belay, the penalty for a slight error in judgment is too disastrous to risk.

³ Chairman of the Committee on Rock-Climbing, San Francisco Bay Chapter.

LOCAL ROCK-CLIMBING

The systematic practice of "falls and belays" needs no justification, but only a plea for more widespread use among other climbing
groups. Our method is to select a small overhanging cliff about
fifteen feet high, and after protecting the belayer by means of an
anchor so that he will not be torn from his stance, we practice falls
of from six inches to ten feet. Tied on in the usual manner for the
shorter falls, or with the bowline as a seat under the hips for the
longer falls, the person falling climbs up a short distance, gathers
in suitable slack, and then—drops like a plummet. It is then up to
the belayer to hold him. If for any reason he is unable to do so, no
harm is done, since the one falling is prepared for such a contingency and is near the ground anyway. By means of such practice
we are able to hold five-foot falls with a standing hip-belay and
up to ten feet with the sitting hip-belay. The ten-foot falls give one
quite a vivid realization of what a fall of the leader would mean,
and what the proper technique would be to correct such a situation.
We feel that with further practice we shall be able to hold falls up
to twenty feet by means of the body belay.

The necessity for such systematic practice is well expressed by Underhill, as follows:

No one should have to attempt a body belay in a critical situation who has not had experience of just what it means to have the full weight of an average man thus thrown upon him. Few persons are prepared for the tremendous drag that ensues—aware how firm must be the knees and how secure the balance to withstand it, or conscious how great a difference is made by the presence of even a little initial slack in the rope, permitting a drop which increases the effective weight.²

We realize thoroughly the value of Young's advice—namely, that "Rock-climbing is best learned upon long and varied passages, away from the staccato allurements of boulders, trick-climbs, and belays." Moreover, we are aware that the continual use of an upper belay may tend to rob the climber of the self-condience that is so necessary in a leader, or may instil in him a false confidence leading to careless habits and eventual disaster. However, the peaks of the Sierra Nevada are 200 to 300 miles away—too far to reach every week-end—so we gain valuable instruction by intensified climbing "Bobert. M. Wichoftlill: "On the grant Management of the Rose is facili Verk."

³Robert L. M. Underhill: "On the Use and Management of the Rope in Rock Work." S. C. B., 1931, xvi:1, p. 84.

³ Coeffire, Winthrop Young: "Mountain Craft," 1920, p. 171.

30 SIERRA CLUB BULLETIN

upon local problems, and wherever the climb is long enough for it to be appropriate, we use the regular technique of a two-man or three-man rope. Of course, we are always hunting for the longer climbs, but we do not have many of them It is the shorter, severer climb with the upper belay that predominates. And we have not found that the fear of the upper belay is entirely justified. The records of the members of the Rock-Climbing Section in the Sierra Newada and in the Yosemite Valley during the past year are chronicled on other pages of this BULLETIN. On none of these climbs have we felt that our judgment or climbing ability was hampered in any way by our customary practice with an upper belay. On the contrary, as I have indicated before, we have all felt that we have derived values from local rock-climbing that we could have gained in no other way.

BELAYING THE LEADER BELAYING THE LEADER TABLE 1, Continued TABLE 1 QUANTITATIVE DATA ON PERFORMANCE OF CLIMBING ROPE1 QUANTITATIVE DATA ON PERFORMANCE OF CLIMBING ROPE! (7/16-INCH DIAMETER; 0.0500 LB/FT WEIGHT) (7/16-INCH DIAMETER; 0.0500 LB/FT WEIGHT) MANILA TEST 1660 1140 1950 2240 2181 3010 2460 82 73 70 732 574 78 Breaking strength²..... per cent of dry, per cent. ft, lb./ft. ft, lb./ft. per cent of dry, per cent of dry, per cent of dry, per cent of dry, per cent of breaking strength number of cycles, number of cycles, number of breaking strength per cent of breaking strength per cent of breaking strength per cent of original breaking strength 13 16 16 Elongation at failure3..... 335 390 93 83 49 104 67 116 Strain energy4..... 99 100 50 58 60 57 58 100 100 7/16 0.0503 2510 2640 in.... lb./ft.. lb.... 2410 1820 2340 2280 2780 650 1000 1970 1545 2320 1815 2360 320 1090 Actual breaking strength..... **FOOTNOTES TO TABLE 1 **FCaution:** Rope-construction methods result in strength variation within the same length of rope as high as ten per cent. Hence the figures given cannot be considered procke, and small differences are only indicative. Since the data were obtained availing a of different dameters, equivalent strength values were correctly and of the strength of the proportional tools are proposed as a percentage of the strength of th Piliraking strength of rope exposed to 9 months of Florida sun and rain, expressed as a percentage of the breaking strength of new tope. "The weight of water absorbed per pound of rope after immersion in water for 24 hours, expressed as a percentage of the increase in weight over the dry weight. In Table 2 thin the later expressed as a reciprocal to show resistance to wetting, which is the property of the prop FOOTNOTES TO TABLE 1 "History acrossed as a percentage of the breaking strength of rope under standard under the property of the pr Winning Mountein Craft, 1700 Ed., p. 93. Walled after 20 cycles.

Typical test data and analysis by Richard Leonard in Belaying the Leader, Sierra Club Bulletin, 1946.

Roping Down: A Short Bibliography

MAZAMA. 1905, 2:4, pp. 230-231.

Deutsche und Österreichische Alpenverein-Sektion Bayerland. Anwendung des Seiles (Use of the Rope). 12th ed. Munich, 1922.

 Schweizer Alpenclub — Sektion Uto. Ratgeber für Bergsteiger (Advice for Mountain-climbers). 2nd ed. Zürich, 1920. Pp. 430-435.
 Young. Geoffrey Winthrop. Mountain Craft. London, 1920. Pp. 192-198.

Climbing Down: the Doubled Rope.

ALPINE JOURNAL. November 1920, No. 221, pp. 209-214. Absellen (Roping

Down), by Paul Montandon.

Verlay, Rudolph Rother, and Franz Nieberl. Das Klettern im Fels (Climbing on Rock). 5th ed. 1922.

Enzensperger, Ernst. Bergsteigen (Mountain-climbing). Berlin, 1924. Pp. 229-233.

APPALACHIA. June 1928, Vol. 17, pp. 53-64. On Roping Down, by Robert L. M. Underhill.

ALPINE JOURNAL. May 1929, No. 238, pp. 63-75. The Spare Rope in Theory and Practice, by E. R. Blanchet.

¹Since this was written, Underhill has pointed out a description, in 1933, of the identical technique. See Bibliography.

ROPING DOWN

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Schweizer Alpenclub — Sektion Uto. Technik des Bergsteigens (Technique of Climbing). Zürich, 1929. Pp. 27-31. Das freie Abseilen (The Free Rope-down).

SIERRA CLUB BULLETIN. 1931, 16:1, pp. 86-88. On the Use and Management of the Rope in Rock-work, by R. L. M. Underhill.

D. Ö. A. V. Alpines Handbüch (Handbook of Mountaineering). Leipzig. 1931. Vol. 2, pp. 110-112. Klettern un Fels (Climbing on Rock), by George V. Kraus.

Maduschka, Leo. Neuzeitliche Felstechnik (Modern Rock Technique). 1931.
Pp. 40-42. (Condensed in Mountaineering Journal, March 1931, 1:3, Pp. 159-161.)

D. Ö. A. V. Mitteilungen. August 1933, p. 186. Note by Fritz Hinterberger on "A Way of Roping Down Without Danger."

October 1933, p. 238. Note and illustration on roping down,

Club Alpino Italiano. Alpinismo. 1935, Vol. 2, pp. 72-88. La Colata a Corda doppia (The Descent on the Double Rope).

Scottish Mountaineering Club Journal. April 1935, 20:19, p. 230. Roping Down, by E. A. M. Wedderburn.

THE LONSDALE LIBRARY. Mountaineering. London, 1934, pp. 97-102. Rockclimbing, by E. R. Blanchet.

MOUNTAINEERING JOURNAL. December 1935. 4:1, cover (photograph).

A few of the other texts/references in the hands of Americans prior to WW2. (Leonard SCB 1940).

ROCK CLIMBERS' PARADISE

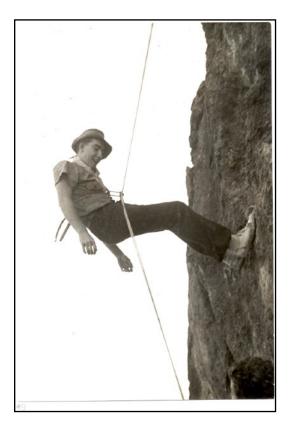
BY DORIS F. LEONARD

WHEN people asked me where Dick and I were going on our honeymoon, instead of blushingly saying, "I won't tell," I very proudly told them that we were going off to the mountains; that we were going to pack in all of our food and equipment for a two weeks' trip, and that my trousseau was to consist primarily of a new pair of "jeans" with a leather patch for roping down, a new parka, a new ice-axe, and plenty of sunburn cream.

We arrived at Bridgeport, our starting-point, on the night of July 16. We had made arrangements to employ two boys who would be willing to help us pack in our equipment. When we started early the next morning, Dick and the two porters were carrying fifty pounds each, while I carried twenty-five pounds. The three-mile climb from the lakes to our camp was a hard one, up three thousand feet, through brush, and over talus, with some relief at the end as we mounted beside sparkling streams and through fragrant pines. We had been on our way for seven hours when we finally reached our camp at an altitude of 10,000 feet. As it was getting late, our porters had to leave immediately on their return trip. Watching them go, we realized that when they went from sight we would be completely alone, with very little likelihood of seeing anyone else until we went back by the same route.

By this time the sun was painting with a deep rosy hue the tips of the spires that surrounded us. We were very, very tired, so we unpacked just the necessary things, leaving the rest for the next day, when we should have renewed vigor and plenty of time. It was a very simple dinner to which we sat down.

As the twilight deepened, we looked off across the distance together. I was frightened. Great tears welled up in my eyes. I felt so small and overpowered as I looked at the tremendous heights around me. I had never spent a night high up in the mountains before, and the silence seemed to be pressing in upon me. I felt walled in. I struggled to shake this horrible feeling from me, and soon felt calmer as I realized that I had someone with me who was thoroughly capable of taking care of me and teaching me and of



Doris Leonard was also a fine climber and wrote inspiring articles.

The Technique of Falling By A. W. Bridge

It does not seem a long time since I eagerly devoured the contents of borrowed Journal
I wanted to understand the technique of walking, the technique of climbing and the doctrin
of descent; and the men who wrote in the journa's on these subjects satisfied me.

But I was very puzzled and yet had not the pluck at that time to ask why there was an article on what seemed to me, to be the most important technique of all—the

I have walted for a long time for a more worthy man to take up his pen and write a is on this subject, but it is evidently thought a rather dangerous subject for a climber iscourse on, or put down his views in cold print before the outside world.

to discourse on, or put sewn in views in cold which bester to falling their ser However I am confident that if climbers will only give the art of falling their ser consideration it may be of great help to them at some time, and so I am prepared to the criticisms which are sure to come my way, and write the article in the hope that is

No one, least of all myself, makes a habit of getting into such positions that he can neither get up nor down, and therefore has eventually either to jump off or fall off, but everyone who climbs runs the risks of at some time or other finding himself in that

Most unfortunate man.

As it is I have managed to get away fairly lightly.

A fixed of mine, who is also a member of my club, sold me that as a lad he had a great
fear of fire, to much so that he set about preparing an estape for himself and chose as an
exit the bedroom window. He practised the art of failing at an early age. For before he
could jump from the bedroom window he had practised fails from the roof of the coal shed,
and then a little higher from the garden wall. Eventually he could jump from the window

and then a little ingree from the garten want. Eventuary the control proprior and make a happy harding.

And to it must be for all of us who wish to be proficient in the art of falling. At first I was very frightened of my rebearsals, but I persevered. A height of only 6 feet was good enough for a start and gradually as I gained confidence I took bigger falls, and as present I can drop myself 25 feet and where in form I can manage about a 30-feet drop.

can drop myself 25 feet and when in form I can manage about a 30-feet drop.

Most of my practice falls were off gristions climas in Derbyshire, and more often still
did I have one or two practice nlights a week in a quarry not very far from my home.

It depends on the cype of pitch as to which falling methods I use. For instance, if I is
an on a slab I deliberately flatten myself against the rock and friction my way down to the
stance. In another instance I may be on a broken face of rock, and in that case I should try
and decide very quickly which is my best landing place and jump. But in both these
instances I must land with my feet together and reluxed muscles, and quite prepared to
roll myself into a ball and not fall backwards on to my head.

It is most important that the leader should let the second know if he is a restronal
to that his zecond can be prepared for the fall. I have seen about free climbers fall in about
the same number of years, and of these five, only one fell in a respectable way.

Early experiments with carabiners (Richard Leonard photo collection).

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The majority will keep the rest of the party in ignorance of their dilemma, and then the first warning seems to be that horrid, convulsive scratching of edge nails against the rock and then a very unhappy landing.

I think that guts and coolness are the most important parts of the technique to develop. I have remarked earlier in the article how frightened I was of my first practice falls. These days I tackle them with much more confidence and takink I have almost got over that fear of falling and suffering very severely from the results.

There have been cases where climbers have had a fall and never had a chance of ving themselves, and I do not suggest in this article that they had the remotest chances doing so.

At the time of writing I read with the greatest of regret of a fatal climbing a le fetches home to me the face that we are all liable to have a fall at some time, and a time a echnique of falling may mean all the difference between a slight acciden very serious one. A sprained ankle is much to be preferred to a broken leg.

Of course, I cannot asy the technique is an art enless I can cach it. I am afraid I am falling misrably at teaching (in print) the art of falling. It would be much eatier for me if I could demonstrate a few practice falls and so prove that I can make a happy landing—and on one occasion a fairly happy landing after I had dropped myself 60 feet. But that was no practice effort.

I do not think I would have tried to write this paper if it had not been for the fact that the rock experts in this country told me that they are confident that the art should be developed by all climbers. These men have given me the confidence to write my views about the art ("hance your arm, Bridge") as one very Hon. Editor puts it, and I hope my efforts have not been in vain.

In concluding this paper I would ask the reader to forgive the frequent recurrence of the personal pronoun, but it is to some extent unavoidable in recounting personal experiences.

NORWAY.

The Photographs in the eight page Norwegian Supplement are by courtesy of

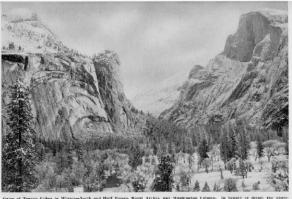
Ideas spread

The same year, 1934, Leonard published with Robert Underhill (ed.), "Piton Technique on the Cathedral Spires" for the Appalachian Mountain Club's Bulletin describing the mechanics of the dynamic belay and technical exposé of the new, safer methods of climbing steep vertical rock. Bestor Robinson, who later wrote "I'm a rock engineer and proud of it" (AAJ 1940), summarised the nature of the climbing achievement in the June 1934 Sierra Club Bulletin:

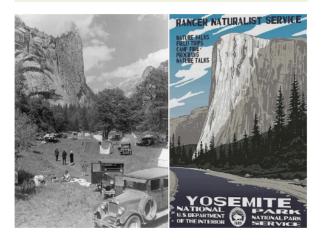
"Looking back upon the climb, we find our greatest satisfaction in having demonstrated, at least to ourselves, that by the proper application of climbing technique, extremely difficult ascents can be made in safety. We had practiced belays and anchorages; we had tested pitons and ropes by direct falls; we had tried together the various maneuvers which we used on the peak, until three rockscramblers had been coordinated into a team. The result was that there was no time on the entire climb, but that if any member of the party had fallen, his injuries would, at the worst, have been a few scratches and bruises."

The idea that the famous imposing pillars of Yosemite granite could be ascended 'alpine style,' and with minimal risk, fundamentally changed the mindset of the climbing game, and increased awareness of the new techniques and access to tools led to historic 1930s climbing achievements in North America, including Shiprock and

Mount Waddington; a whole new breed of American rock climber was spawned, complete with regional rivalries for the 'last great climbs'. More of their envisioned climbs and history will follow, a progression that leads into the 1950s, when technical big wall climbing reaches an internationally high crescendo as a myriad of developments in tools, technique, and skill merge and combine.⁹²



states of Tessaya Calon in Wiston—North and Half Bours, Beyrd Arrives, and Washington Colomo. In beauty of stead, the photograph near proposalized is the dates are terminated or in the same are transfer of these communing offices and peaks. See the severboom of the sarrives from the restriction of the sarrives from the contract of the sarrives from the contract of the sarrives from the s



Left: Camp 9, Yosemite, 1920s. Right: Yosemite travel poster.

⁹² Footnote: The AMC article is also the origin of "bombproof", a term climbers often use to indicate a solid anchor system. Leonard notes that "it is essential that pitons for anchoring the belayer or for serving the leader as effective belays be 'dynamite proof'". Although this article is relatively rudimentary, in the years following, Leonard partnered with engineers such as Wexler on the scientific testing of ropes, pitons, and carabiners, was instrumental in the design and testing of early nylon ropes, and was a significant player in the army's 10th Mountain Division's tool and technique developments (tk). Perhaps more importantly, he authored concise data and articles on both tools and novel techniques which spawned further innovation. The engineer Chuck Wilts picked up this torch in the 40s and 50s.

Postscript: Leonard's creative conservation imagining

In the following decades, Leonard continued as a leading climber and proponent of safe climbing systems. And with the same approach to climbing, he applied to environmental activism, first by imagining things others thought were impossible, then tactfully creating the safest framework for optimal chances for success, and finally strategically achieving some of the greatest environmental summits of the 20th century. Leonard was at the core of the Sierra Club's environmental work for decades as they became America's most effective organization for the preservation of remaining wilderness for many decades hence, and he was closely involved with the Wilderness Society, Save-the-Redwoods League, and the Conservation Law Society of America, among others. His wife Doris was also a strong leader in the growing environmental movement and they were instrumental in preventing the Echo Park Dam in Dinosaur National Monument. Some of these battles were controversial, but all were instrumental in the lead-up to the Wilderness Act of 1964.93

"To temper the daring with the reasonable" 94

As in climbing, failure happens in conservation efforts. Some are only setbacks, but some end in fatalities, such as the 1901-1913 efforts to preserve Yosemite National Park's Hetch Hetchy Valley; John Muir fought the battle to prevent Hetch Hetchy from being dammed every year for thirteen years "and he only lost it once. That is the tragedy of conservation or environmental battles," as Leonard noted. Hetch Hetchy was damned in 1913 by the Raker Act, and soon after actually dammed.

And just as with climbing teams, strategy trade-offs and ideal objectives resulted in clashes of personality. Leonard and one earliest climbing partners, David Brower, once a team that made bold forays on great climbs, they later clashed on both counts during environmental challenges. Brower, who later became known as the Archdruid of America's environmental movement, focused more on shifting the public's conscience, while Leonard chose his battles carefully, preferring a negotiated behind-thescenes legal approach, which liaised the environmental voice with the legal mandates

⁹³ Footnote: in 1951, at the second Sierra Club Wilderness Conference, chaired by Leonard, Howard Zahniser, executive director of Wilderness Society (1945-1964) brought up his initial recommendation for a wilderness bill. It took thirteen years of hard work to get the Wilderness Act enacted by Congress on September 4, 1964. In 1955, 1957, 1955, 1957, and 1959 Doris Leonard was in charge of the Sierra Club Wilderness conferences. Later, she founded the Conservation Associates, which led many successful preservation efforts.

⁹⁴ footnotes: "To temper the daring with the reasonable" quote describing Leonard's ideals from Susan Schrepfeer, Leonard's oral history Interviewer-editor (1975). Richard Leonard and David Brower began climbing together in the mid-1930s, both making early attempts on Mount Waddington as a Sierra Club outing objective in 1935, having trained on winter ascents of peaks in the Sierra Nevada. Leonard returned to Waddington in 1936, opting for a steep arete—a lower-risk objective risk but with much more technical rock climbing; the main line was a "chute 3000 feet long at an angle of about 65 degrees. Any rock or ice would come down that gulley so fast you couldn't even see it" (Leonard, 1975—this gulley was the path of the first successful ascent). Both Leonard and Brower were involved with the climb of Shiprock in New Mexico when California and Colorado teams were both vying for the first ascent (Leonard served as the 'intelligence officer' for the successful ascent by David Brower, Raffi Bedayan, Bestor Robinson and John Dyer in 1939). Some of Leonard and Brower's first ascents in Yosemite like the south arete of Arrowhead Spire in 1937 were among the hardest of the day, and their early attempts on the Lost Arrow (to the 'First Error') might have been the site of Yosemite's first pendulum. For excellent data on Yosemite's historical first climbing ascents, refer to Ed Hartouni's resources (edhartouni.net)

of the land agencies. Leonard wrangled with other champions of the wilderness, like the inspiring writer and activist Martin Litton who ran dory river trips in the Grand Canyon, who had a more radical style, "I believe in playing as dirty as they do, or worse, if the end is a noble one," Litton once said, "My feeling has always been, you can't always win, but you can always try. And that we're not as poor dor the battles we've lost as for the ones we never fought." Both Litton and Brower did not think Leonard bold enough at times, such as during the struggle to preserve Glen Canyon (The Place No One Knew), but like his minimal-risk climbing tactics, he considered some of Brower and Litton's efforts 'harmful' in the long run (i.e. too risky).

For whatever his successes and failures. Richard Leonard's successful environmental litigation challenges, an uncharted strategy of earlier preservationists who depended solely on broad public support, became a prime mechanism for the preservation of public lands in the United States in the decades following, and his endeavors became a model for generations of leading climbers engaged in conservation and environmental preservation through organizations like the Sierra Club and the American Alpine Club. Just as it is said there are few 'old, bold climbers' (only old ones or young bold ones), Leonard's ability "to temper the daring with the reasonable" led to a great series of successful campaigns during his long involvement with climbing and conservation.95

Leonard's environmental activism approach often had three tenets, requiring constant attention to organized teamwork:

- Hold the public land managers to account, often with legal means.
- 2. Arouse the public conscience to gain national support.
- 3. Squelch factional disputes by establishing catalysts for collaboration and agreement. One of the main debates in Leonard's time, then as now, is the appropriate level of development of preserved wild lands—i.e. access to all (leading to extensive roading), none, or some.

⁹⁵ Author note: I once informally interviewed both David Brower and Martin Litton in 1997 and 1999, collecting notes for an unrealized creatively imagined article I hoped to write called "Champions of the Wilderness." Both Brower and Litton were impressive in the way they expressed the importance of the natural landscape— I will find those notes sometime. I was especially interested in Brower's motivations and challenges in setting up Friends of the Earth in 1969, as my interview was about the same time Greg Adair, Tom Frost and I set up Friends of Yosemite Valley (1997). We also worked with a great environmental lawyer named Richard, Dick Duane, for our Camp 4 preservation efforts in 1998.

Richard Leonard Sources include:

*Oral history interviews on his life of climbing and environmentalism: Richard M. Leonard MOUNTAINEER, LAWYER, ENVIRONMENTALIST <u>Volume I and Volume II</u>, With an Introduction by Francis P. Farquhar An Interview Conducted by Susan R. Schrepfer 1975 by The Regents of the University of California and The Sierra Club Foundation.

*[Richard M. Leonard photograph collection of rock climbing techniques, The Bancroft Library, University of California, Berkeley.]

*See also Leonard's movies here.

"People always tell me not to be extreme. 'Be reasonable,' they say. But I never felt it did any good to be reasonable about anything in conservation. Because what you give away will never come back—ever." —Martin Litton

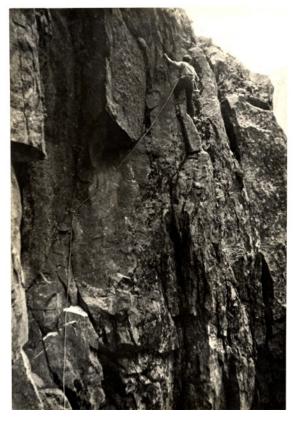
"You can get a lot done if you don't care who gets the credit." — Richard Leonard

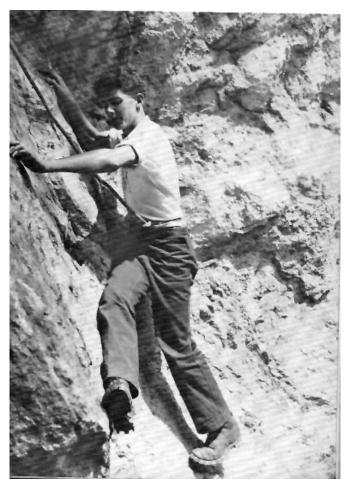


Eichorn on the way to the First Error, Lost Arrow Spire

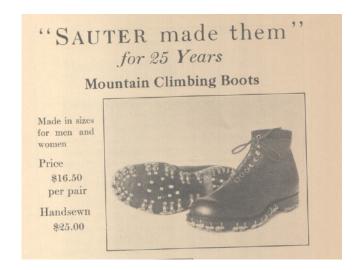


Dick Leonard and friends-(possibly Jules Eichorn and Helen LeConte) image courtesy Sam Johnson

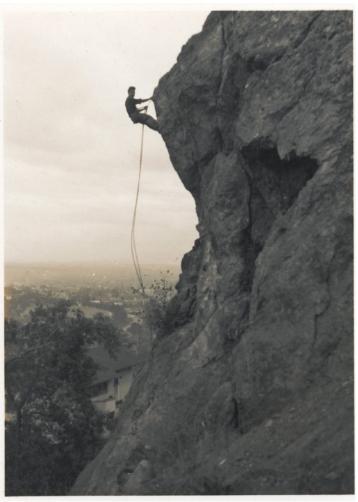




A young David Brower on the Berkeley crags. Richard Leonard Photo Collection.



A popular brand of boots in the 1930s, though many also used tennis shoes for rock climbs.



Dick Leonard 1933. Rappelling off the local classic climb "Farewell to Arms" Courtesy Sam Johnson.



Richard Leonard photo collection.

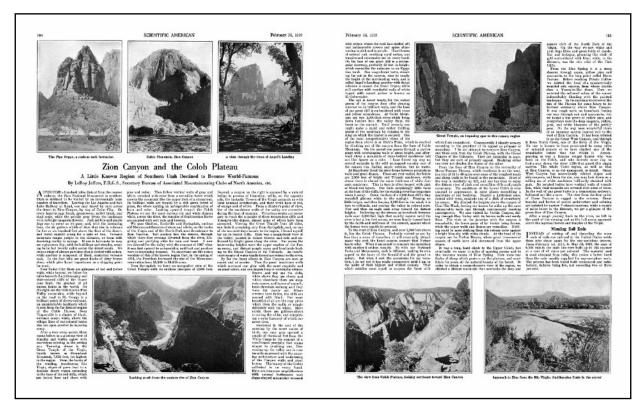


Gear racks of the future (from the 1930s perspective--1980s piton rack shown).

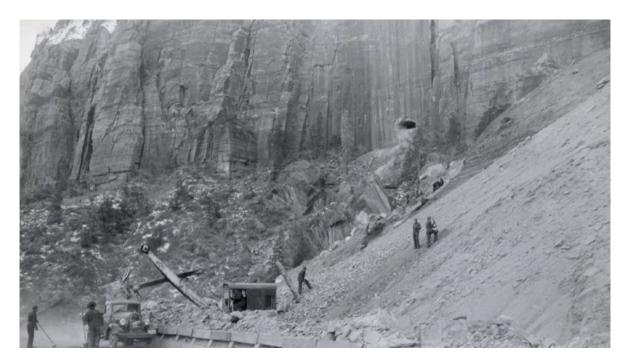


Old gear found by author over the years. If they could only talk...

PART 3 NORTH AMERICAN DEVELOPMENTS IN THE 1930s-1940s



ZION NATIONAL PARK. Shortly before LeRoy Jeffers' 1919 climb of Mount Moran in the Tetons, he published this article in Scientific American highlighting the peaks of Zion National Park, which had become Utah's first national park that year. Jeffers notes the two 1000m cables from "the forest on the summit of Cable Mountain" bringing lumber to the valley (operational from 1904-1930), but that otherwise the "summits of these tremendous cliffs and Yosemite-like domes, almost none of which had been ascended." Jeffers attempted to climb the 'Great Temple', but failed due to lack of water.



Left: Zion east rim road tunnel in Zion National Park construction began in the late 1920s, an incredible feat of civil engineering. Courtesy Zion National Park Museum.



The view of Zion National Park from the East Entrance, the switchbacked road with its 1.8km connecting tunnel through the sandstone mountains was completed in July 1930 as part of the "Grand Loop" of national parks and monuments. West Temple seen on left.

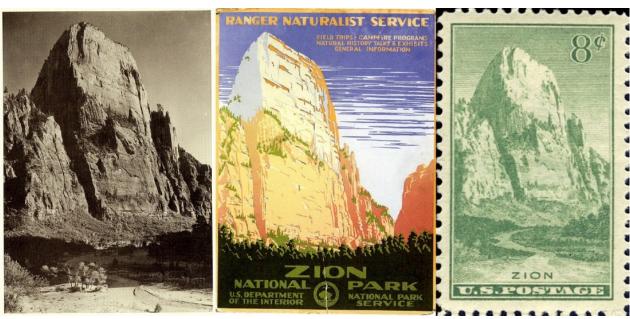
Zion Climbing in the 1930s

Daredevils in Zion—the Great White Throne

In June, 1927, Bill Evans, a "distinctly daredevil type and a mountaineer" (superintendent's memo 7/13/27) set out to climb the Great White Throne in Zion National Park, armed with only 15 feet of rope and a small canteen of water. Evans was inspired by a Los Angeles Times article calling the Great White Throne "the vast keynote of Zion" and that "the foot of man has not scaled it." After being thwarted by steepening walls on the north side. Evans found a route to the southern saddle, then made his way up slabs to the summit where he spent the night, lighting several signal fires visible to folks in the Grotto auto camp far below. The next day he did not return, and a historic rescue effort was organised by chief ranger Walter Ruesch (for whom Walter's Wiggles on the

Angel's Landing trail is named). After days of searching on the steep terrain, Evans was found tangled up in a manzanita bush near the saddle, delirious and weak, having been without water and food for nearly three days in the Zion summer heat, and remembering little of the preceding days. He was carried down by a makeshift stretcher constructed on the spot from wood poles, rope, and Ruesch's overalls, and required months to recover. He later recalled intentionally initiating a controlled slide down the steep slabs, but lost control and tumbled hundreds of feet.

Evan's ascent of the Great White Throne became famous and was reported in over 100 national newspapers, but it was the skill and daring of the rescuers that was celebrated locally. The park superintendent's report concludes, "The point that always strikes me is the selfishness of some of the



The Great White Throne in Zion National Park (the 1927 ascent went up the (much less steep!) backside navigating a long and devious route. Fred Beckey, Galen Rowell, and Pat Callis climbed the NW wall in April, 1967, one of the first bigwalls in Zion, using 40 mostly large angle pitons (130 placements) and 9 belay bolts. Lag screws and "12-inch Austrian ice pitons" were also used in the soft rock.

people who try these things. They race off in a reckless manner, trying to secure some empty glory for themselves by doing something a sane person would never attempt when they get into trouble, and it is necessary to risk the lives and limbs of others trying to help them out."

Second daredevil ascent

The second reported climb of the Great White Throne was another soloist in 1931, by Don Orcutt who reported finding a human scull on the summit, "yellow and brittle with age", most likely from a previous era and further evidence of the climbing abilities of Indigenous peoples. A few days after his Great White Throne ascent, Orcutt fell while trying to climb Cathedral Mountain, and his demise from "a 1000-foot fall" was widely reported in national newspapers, while the 1932 American Alpine Journal noted, without naming Orcutt, "The crumbly sandstone monoliths of Zion National Park have also claimed a victim, a solitary climber, whose fall may probably be explained by the deciduous nature of the handholds." These solo ascents were condemned by the park, as they were "improperly executed and done in a manner that is strongly disapproved by all alpinists having recognized reputations" (1931 Park Service memo).96



W.H.W. Evans from Pasadena, scaler of the Great White Throne, signed "gratefully" Photo: NPS records.



The article that inspired Evans to travel to Zion to scale the Great White Throne (Angel's Landing pictured).

⁹⁶ Footnote: In September 1937, Fritz Weissner is recorded to have attempted the Great White Throne with W. Allemann, but failed for unknown reasons; in November 1937, Glen Dawson and team completed the third recorded ascent of the Great White Throne prior to their East Temple climb. In 1949, on the fourth reported ascent, Herb and Jan Conn described the route to Richard Leonard as "pure friction work up a surface well lubricated with sand grains. The hands are almost worthless. The main problem is to judge where the angle is lowest and to find dependable anchors, usually scrubby bushes, within a rope's length of each other. We used three bolts to supplement the bushes. (It doesn't take much more than two minutes to drill a two-inch hole!)". In 1976, Paul Horton reports "It was more difficult than we expected -- although we would only rate it about F6. There are long unprotected runouts on difficult friction and some poor belay anchors. We saw many old bolt holes and found one fixed piton."

Alpinists discover Zion

In the summer of 1931, German alpinists Walter and Fritz Becker, along with the American Rudolph Weidner, successfully climbed Cathedral Mountain with rope and belay, involving a difficult chimney and an overhang that "taxed all their powers of ingenuity and endurance to pass." It is not known if they had pitons or other gear.

West and East Temple

In November 1933, using ropes and aided by "small rocks or pebbles wedged into cracks" as natural chockstones, the local Springdale brothers Norman and Newell Crawford climbed the West Temple, considered the "most impressive and majestic peak in Zion National Park". After four hours of climbing from the valley below, they lit a traditional signal fire on the summit at 2 pm, then descended in two hours. A few months later, three climbers, equipped with only a 10m rope, became stranded on the descent when the first man down dislodged some of the crucial chockstones while descending, and the others "dared not make the attempt with such a pathetically inadequate rope". Norman Crawford joined the NPS rescue team comprising eight people and "three

ropes, totaling 160 feet" to rescue the two stranded climbers and continued on for the third reported ascent.⁹⁷



Cathedral Mountain, Zion National Park



West Temple was known by the Paiute people as "Tempo-i-tin-car-ur" meaning "Mountain without a trail."

⁹⁷ footnote: The fourth recorded ascent of the West Temple was not until 1963. In 1990, Springdale climbers Brad Quinn and Darren Cope took the local tradition further by climbing the first route up the West Temple's 700m east wall, an 18-pitch bigwall climb requiring two bivouacs, calling their masterpiece, "Gettin' Western" (VI, 5.10, A2). The route had previously been attempted by Bill March and Bill Forrest, who left a rack of his Titons (t-shaped nuts produced from 1973-1985) halfway up as a booty bonus. It was Brad and Darren's first bigwall (Brad was a solid 'Zion 5.10' climber, i.e. hard 5.11 anywhere else).



Glen Dawson (1912-2016)

Glen Dawson, a member of the Southern California Chapter of the Sierra Club, was the first to bring modern tools and techniques to Zion. Already an experienced High Sierra climber, in 1935 he climbed "about 30 routes" in the Wetterstein and the Dolomites with Theo Lesch, a 'Munich climber' and one of the "world's best," gaining further experience with pitonprotected climbs, including the south wall of Marmolada in 5.5 hours, and the famous Herzog/Fiechtl route on the Schusselkarspitze (172nd ascent, see Volume 1 for the history of these global testpieces). In May 1937, Dawson climbed Yosemite's Higher Cathedral Spire with Dick Jones, and in September climbed a new direct route up the East Buttress of Mount Whitney, using four pitons for protection and belays. In early October, Dawson led the Mechanic's Route at Tahquitz using 16 pitons, a 3-pitch hard 5.8 noted as the "hardest prewar rock climb in the country" (Chris Jones, Climbing in North America, 1976).

Later in October, 1937, Dawson and Jones traveled to Zion and climbed the third recorded ascent of the Great White Throne with Homer Fuller and Wayland Gilbert (Jo Momyer accompanied the team but did not summit), and the next day set out to climb the East Temple, equipped with "tennis shoes, one 2-man rope (7/16" diameter, 90 feet long), one three-man rope (7/16", 135 feet long), one rope-down rope (5/16", 200



Glen Dawson on the first ascent of the Sentinel in Zion National Park, June 1938 (Glen Dawson Collection). Perhaps the same pitch led by George Lowe on the second reported ascent of the Sentinel—I recently asked George, who I climbed with once in Yosemite many years ago, but he remembered climbing with Karl Dunn, but not the details. George Lowe and his partners did many early ascents in Zion, and can be examined in the Zion notebooks (link below).

feet long), a piton hammer and two pitons." On the summit, in the budding Zion mountaineering tradition, they spent the night on the pleasant forested mountaintop and lit signal fires near the rim for their audience below. They reported their climb as much more difficult than the Great White Throne, with the last ten feet involving a three-man stand (a courte-échelle) and noting, "It would be impossible for a party of less than three to get up unless it used different equipment." The second recorded ascent of the East Temple, 27 years later (1964), involved a drilled bolt and eight pitons for the final climb to the summit.



These two youths and three companions scaled a new route up the eastern face of Mt. Whitney, considered the most difficult rock climb in the United States. Glenn Dawson is shown holding piton and caribiner while his brother Muir looks on.

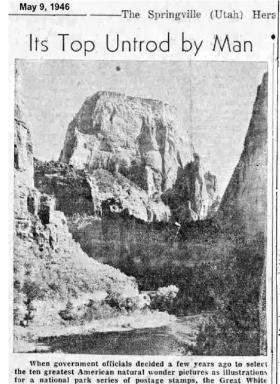
Photo of Muir and Glen Dawson in 1937; Glen holding the latest piton and carabiner design starting to be more widely available in the USA. Source: The Sierra Echo, Glen Dawson, A Final Tribute (Bill Oliver, 2016).



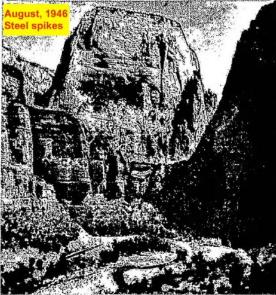
The Sentinel, Zion National Park. Early routes ascended the left skyline. Birdbeak Spire is a 800 foot spire on the center frontside.

Sentinel 1938

In June 1938 Dawson returned to Zion with Bob Brinton and climbed the Sentinel, only briefly described as "loose and treacherous, even for Zion" in the park service records. The second reported ascent of the Sentinel, in 1966, George Lowe, Dick Bell, Karl Dunn and Harold Goodro climbed it via the ridge rising from the Court of the Patriarchs. Lowe led the last pitch free, a traverse out to the right on a "two-inch ledge" with "practically no handholds" and "hundreds of feet of exposure." The others on the 1966 team required pitons and aid with stirrups to climb the final part, reporting the last pitch to be the hardest in Zion (Dunn). They had no knowledge of Dawson and Brinton's ascent nearly 30 years prior and believed they were the first to summit the Sentinel.



Throne, towering master of Zion National Park, was one of those chosen. Its gleaming white precipices defy venturesome climbers its plateau-like top untrod by man. Zion National Park in south ern Utah is a summer mecca for tourists from all over the world



ATOM'BOMB DEFENSE

Rocket Tests Slated At Wendover Base

President Awaits Start of Atlantic Cruise

Indication of why the army ington said Thursday the rocket wants an additional 3,000,000 acres of Utah's western range land was given Thursday when at force high speed, high altitude enemy given Thursday when at force in the speed, high altitude enemy officers and officials of Boeing aircraft."

Alteraft Co. announced development and planned testing of a life missile's range, speed and altitude enemy of the spe WASHINGTON, Aug. 15 (INS)

Climber Saved In Zion Park Rescue

Employe Caught On Ledge of Great White Throne'

Special to The Telegram ZION NATIONAL PARK movies was accomplished in national park Wednesday ight when an eight-man party took a park service employed edge high on the Great 1

Roger Clubb, about 22, believer to be from Denver, Colo., was re-He spent almost 36 hours on the huge rock without or water.

Caught on Ledge

History repeats, 20 years after the "daredevil" Bill Evans read in the paper in 1926 that Zion's Great White Throne had not "been trod by man" another clamberer in 1946 read the same (fake news) and got stuck like the first guy. Note steel spikes used for the rescue, perhaps first Zion climbing bolts.

Authors Note

More Zion history will be covered in future research. I have recently made all my Zion notebooks available online, covering the period from 1920s-1990s. Here is the link: http:// bigwalls.net/JMZionNotebooks/album/ index.html Note: These journals and notes are currently being shipped to the University Libraries at Utah State University, per their request as there is a lot of historical information of Zion climbing not available anywhere else. I lived in Hurricane Utah for many years and was a member of the Zion Rescue Team, being called out on a number of technical vertical rescues and many trainings. In the mid-1990s, they asked me to help organize the park's climbing notebooks, a several-week project as the notes were in complete disarray and made finding information

for climbing rescues difficult. I made several bound printed versions of the organized information, but unfortunately I did not keep one -one was left at the Rock House, and one at the NPS offices. The link above has copies of all the notes (all originals were archived by the NPS) but are not as organised as the notebooks I compiled for the Park Service! I also collected a lot of new information by active bigwall climbers in the 1990s (ps.,by the way Darren Cope who managed the Rock House, tells me the rock climbing haven that was the Rock House changed primarily because his relatives simply wanted to move back to that idyllic spot in Springdale. Sorry, Darren, about quote in Alpinist. I am still sad about the demise of Brad's treehouse).

Bugaboos Note

Glen Dawson was a luminary of this new era of hard piton protected free (and occasionally a bit of aid) climbing, traveling far and wide to challenge his skills; in August 1938 made his way to the Bugaboos with his brother Muir, Bob Brinton, Homer Fuller, Howard Gates, and Spencer Austin (who wrote up their trip report in the 1939 Sierra Club Bulletin). Glen repeated Bugaboo Spire with the whole team, then climbed the second ascent of the Brenta Spire with Austin and his brother Muir, and the second ascent of Marmolata with Bob Brinton.98 Although not all climbs required pitons, the 1938 Bugaboos season proved that piton climbing was becoming more "transparent" in that climbers equipped with a few well-designed lightweight pitons, challenging long rock climbs in alpine conditions could be ascended efficiently and (relatively) safely. Glen Dawson was clearly in the vanguard of this developing style of

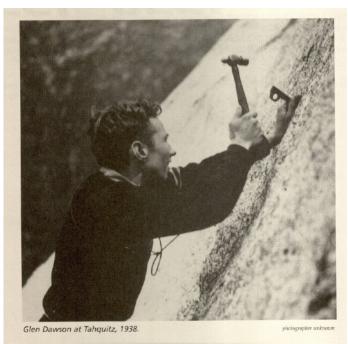


Either Glen or Muir Dawson in the lower left in this photo taken on the Brenta Spire in the Bugaboos in August, 1938, on the second ascent. The route and summit had been first climbed a few months earlier by American Alpine Club members (see Percy Olton, The Bugaboos, 1938 in the 1939 AAJ). Photo from 1939 SCB.

mountaineering with his broad experience on the large faces of granite, sandstone, and limestone in North America and Europe.⁹⁹

⁹⁸ Footnote: The team placed and also found at least two fixed pitons on Bugaboo Spire from prior ascents, including one on the Gendarme where Kain famously unsuccessfully tried to jam an ice axe, placed by Sterling Hendricks, Lawrence Coveney, Percy Olton on the second ascent (AAJ 1939). If Sierra Club's team was indeed the third ascent as reported, then the piton Percy Olton reports finding fixed below the Gendarme in 1938 on the second ascent must have been placed by Conrad Kain on the first ascent in 1916, probably as a way to belay his client (see Kain sections earlier in this volume). But it's unknown what type of pitons Kain would have been using in Canada, though I suspect they would have been ones he purchased at Mizzi Langer in Vienna.

⁹⁹ Footnote: 1938 was a big year for the Bugaboos and among many repeats, seven new routes were climbed, in addition to Dawson's team, by Percy Olton, E. Cromwell, F.S. North, L. Coveney, S.B. Hendricks, P. Prescott, M. Schnellbacher, Miss G. Engelhard, D.P. and I.A. Richards, C. Cranmer. Prior to 1938, there only appear to be three active years: 1916 (Kain/MacCarthy team/Frind/Vincent—three new routes), 1930 (Cromwell/Kaufmann/Kain—four new routes), and 1933 (Kain/Thorington—one new route).



Glen Dawson's only new route on the granite of Tahquitz was The Mechanic's Route, aptly named for its hard piton-protected free climbing, and was also known as Bookseller's Route. Glen's father Ernest was a prominent bookseller in downtown Los Angeles. Climbed with Dick Jones in 1937, 16 pitons were used to protect the three-pitch climb, and was considered the hardest and boldest climb in Tahquitz for many years.

Tahquitz became a key training ground for Yosemite aspirants for the next several decades. The first climbing route at Tahquitz (near Idyllwild) was in 1936 by Jim Smith from the Los Angeles Rock Climbing Section of the Sierra Club, of which Dawson was also a member.

Mount Waddington--Mystery Mountain (1936)



"Fritz Wiessner releasing the carrier pigeon with the message that Waddington was conquered." (Off the Beaten Track, Betty Woolsey, 1984)

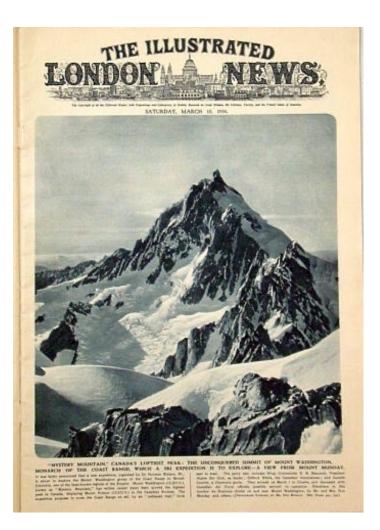


Mystery Mountain, Coast Range, part 1 (1922-1934)

Early sightings and attempts

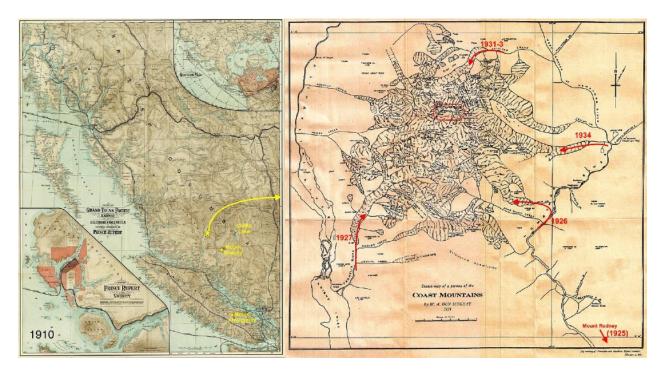
In 1922, while carrying out topographic surveys near Chilko Lake, Captain R.P. Bishop sighted "a peak of great height" in an uncharted region of the Coast Range. The next year, working with Victor Dolmage of the Geographic Survey of Canada, they estimated that the unnamed peak was over 13,000 feet tall. Reports of this discovery "fired the enthusiasm of two Vancouver mountaineers, Mr. and Mrs. W.A.D. Munday, who organized an expedition to conquer this new monarch of the Coast range" (The Province, Jan 15, 1928).

In 1924, Don and Phyllis Munday climbed Mount Robson (with Conrad Kain on a ACC camp), which was then believed to be the highest point in British Columbia, and in 1925 the couple began a decade of effort to climb this "peak of great height" in the Coast Range. They initially sighted the range from Mount Arrowhead on Vancouver Island, 140 miles distant, then climbed to high points above Bute Inlet, 50 miles distant, to gain a grasp of the challenge and to get a closer look at the range's imposing centerpiece that became known as "Mystery Mountain" (also known as Mount Mystery or Mystery Peak). Surrounded by impenetrable bush and treacherous glaciers on all sides, access into the range would prove a formidable challenge. 100



The idea of the unclimbable Mystery Mountain in Canada entranced the world (1934).

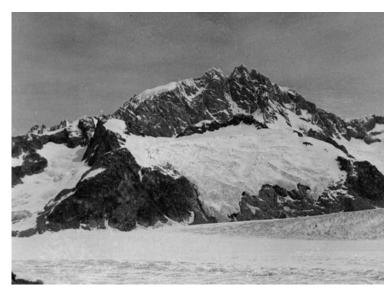
¹⁰⁰Footnote: many uncharted mountains were called 'Mystery Mountains' in this era, including Mount Everest in 1920, known to be the highest peak in the world (but still a mystery of access), the unmapped 'Bunya' range in Australia in 1919 ("Queensland's Mystery Mountains", despite being well known by Indigenous people), and ranges like the Dzhugdzhur Mountains in Siberia and the Mountains of the Moon in Africa, noted on early maps but not yet known by foreigners. Basically, any ranges not well known by Europeans were often coined "Mystery Mountains" in this era.



In 1910 very little of the Coast range had been surveyed or mapped. The earliest reported sighting of Mount Waddington by non-Indigenous people was near Chilko Lake in 1922. Right: 1934 map created by Don Munday, who with his partner Phyllis spent ten years exploring the region for a feasible route up to the summit of Mystery Mountain, as it was known before it was named Mount Waddington in 1928.

In 1926, after an epic struggle bushwhacking through devil's club and alder bush from the east via the Homathko River (noted as the "Terror of the North"), the Mundays traveled up the eastern glaciers to the southern ramparts, deeming the south wall "out of the question," and unsuccessfully attempted the southeast ridge of Mystery Mountain.

In 1927, they discovered an easier approach from the south via Knight Inlet, and attempted the northwest ridge, getting caught in a fierce electrical storm and aptly naming their highpoint, 'Fireworks Peak' (one writer later headlined the story, "Storm makes human torches of alpinists.")



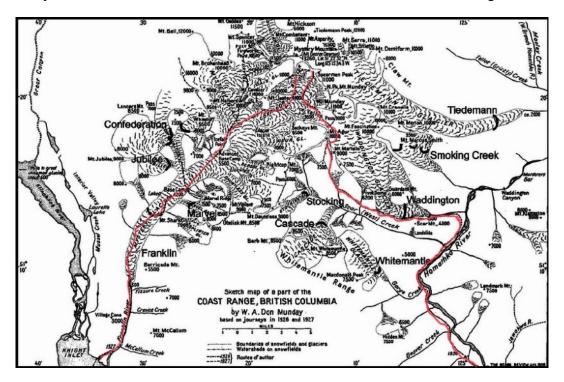
The southern wall of Mount Waddington. Don and Phyllis Munday first attempted the main summit in 1926 via the southeast ridge (right skyline) but were thwarted by dangerous and convoluted terrain. In 1928 they climbed the northwest summit (left) via the northwest ridge (left skyline).



Don and Phyllis Munday

In 1928 the Mundays returned (with Don's brother Bert) via the southern route and successfully climbed to the northwest summit, which some papers reported as the "conquest" of the mountain, even though the main summit was clearly higher. The Mundays continued to make several more

attempts from various directions over the next five years, but as they considered the southern flank unclimbable, they were unable to find an alternate route to the top of Mystery Peak, though their first ascents of many other summits in the range were also considerable challenges.

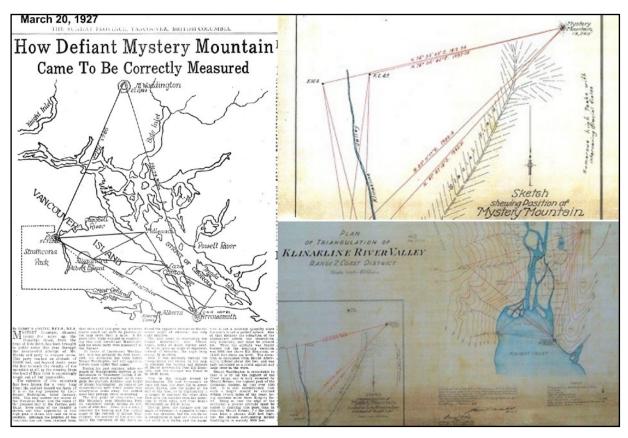


Sketch map of the range by Don Munday, showing the first two routes pioneered to access Mount Mystery. The eastern route (1926) involved extremely challenging bushbashing in the Homathko river valley to access treeline. In 1927 Don and Phyllis Munday cut a trail from Knight Inlet to the Franklin Glacier, which eventually became the preferred route to the mountain.

Highest Peak

After its initial sighting in 1922, various surveys had attempted to measure the height and location of the peak, but it was not until January 1928, when the 1927 annual report from Canada's Department of

Lands was made public, that the official height of the peak was announced to be 13,260', and thus higher than Mount Robson, previously thought to be the highest in the Rockies and the Coast Range.



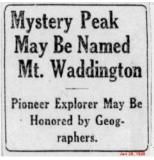
Left: An erroneous survey by Leroy Cokely, who claimed that Lt. Waddington had mapped his eponymous peak. Cokely's triangulation survey probably measured a smaller peak visible from Mount Arrowsmith and claimed the summit of Mystery Mountain to be 11,884', over a thousand feet lower in elevation than Mount Robson. Right: the more accurate survey from the Department of Lands; Surveyor-General Patullo reported: "A connection was also made by triangulation from the head of Knight Inlet along the valley of the Klinaklini River to the 1926 surveys in that valley, thus completing a connection between the Coast and the Interior nets. During the progress of this work the surveyor was able to determine the position and elevation of a mountain in the Coast Range which is doubtless the highest peak in the Province. This mountain has been featured in the press as "Mystery Mountain," but the Department proposes to recommend to the Geographic Board of Canada that it be named "Mount Waddington" to commemorate the name of an early active pioneer, Alfred Waddington, who was in 1863 identified with a project of building a road up the Homathko Valley from the head of Bute Inlet to the Interior. The elevation of the mountain was found to be 13,260 feet, which is nearly 300 feet higher than any other known in British Columbia." The current measured height is 13,186'.

Naming Mount Waddington

As the peak became famous as the highest in British Columbia, several articles in newspapers reported that Alfred Waddington, an early Canadian explorer, had noted a peak of "extraordinary height near the head of Jarvis Inlet" and that he had noted a mountain on his 1862 sketch maps corresponding to the position of "Mystery Mountain", and thus deserving of the mountain's name. Waddington first came to the area during the Fraser Canyon and Cariboo gold rushes and had attempted to construct a wagon route from Bute Inlet to the Cariboo goldfields on the eastern side of the Coast Range, an incursion into indigenous lands that created conflict with the Tsilhqot'in Nation in what became known as the Chilcotin war of 1864 (aka the Bute Inlet Massacre, as the leaders, believing they were attending peace talks, were first arrested, then executed).¹⁰¹ As the name 'Mount Waddington' gained traction with the Geographic Board of Canada, several letters to the editors in the newspapers objected, suggesting that retaining the name "Mystery Mountain" was more fitting for the inaccessible and as-yetunclimbed peak. One wrote that visitors "would be more likely to take a trip up the coast to see 'Mystery Mountain' than he could to see 'Mount Waddington' imagination counts both in publicity and advertising". Don Munday, based on his extensive exploration and mapping of the region, made a clear case that Waddington had likely never seen, and certainly had not mapped the peak.¹⁰²

Despite the questionable naming, once it was discovered that the highest mountain in British Columbia was a little-known peak that some still preferred to call Mystery Mountain, it was not just the Vancouver alpinists who became interested in its ascent. The mountaineering world took notice, and the unclimbed challenge was broadcast on both sides of the Atlantic. The writer initially reporting on the official survey in 1928 predicted, "Now that the mountain is established as the highest in British Columbia, it is expected to excite keen rivalry among Canadian and foreign engineers with a view of achieving the first ascent." Over the next eight years, it became the most coveted unclimbed

summit for North American aspirants, and mountain climbers. alpinists, and rock climbers all came from far and wide.



ROBSON LOSES GRIP

tain in B. C. is 13,260 Feet High

OTTAWA, April 13.-Excluding the mountains of the Yukon Territory, the monarch o' Canadian peaks has hitherto been believed to be Mount Robson,

in the Rocky Mountains, British Col-ROBSON LOSES GRIP

AS MIGHTIEST PEAK

Newly Discovered Mountain the Rocky Mountains. British Columbia, north of the Yellowhead Pass. Its height is 12,972 feet. Word has put been received in Ottawa from Victoria, British Columbia, that a higher lord loss of the Range. It is estimated to be 13,260 feet in elevation. In the same neighborhood are two peaks 12,000 feet in height and several others 11,000 fee several others 11,000 feet in heighth.

The new monarch will bear the name
Mount Waddington,
dington, a British
who did exploratory work in the region
in the 1860's in connection with his
advocacy of road and rail communication from the head of Bute Inlet to
Cariboo and across the continent to
Eastern Canada.

The Windaw Size, April 13, 1928

¹⁰¹ Footnote: The traditional territory of the Tsilhqot'in includes most of the drainage of the Chilcotin River and the headwaters of the Homathko, Kliniklini and Dean Rivers flowing westward through the Coast range. In 2018, Prime Minister Justin Trudeau formally apologised to the Tsilhqot'in people for the wrongful conviction and hanging of the chiefs (CanadianEncyclopedia.ca). In 1858 Waddington published The Fraser mines vindicated, or the history of four months (Victoria).

102 Footnote: Regarding naming, Dr. Glenn Woodsworth clarifies: "The naming thing was a bit of a dust-up between provincial and federal forces, as I recall. Other names that were proposed included "Mt George Dawson" (for G.M. Dawson, the great Canadian scientist, Dawson in the Yukon, Dawson Range, etc.) and "The Unknown Soldier" to try and preserve a bit of the "Mystery" theme."



Declares Waddington Did Not Know of Mystery Mountain

Sir,—May I correct one error in a front page article in The Province of January 15 announce, the official height of Mystery Mountain? The despatch from Victoria states that Mystery Mountain is shown on Alfred Waddington's map of the Homathke River. I happen to be one of the only two people who hnow positively that his is not the case, my wife being the other person.

this is not the case, my wite being the other person.

I have an excellent photostatic copy of Waddington's only map. He was more interested probably in finding a trail than in high peaks, sketches of the outlines of peaks that looked prominent from the Homathko Valley. To one knowing the country it is obvious that he made scant attempt to give even their approximate positions, such a method obviously not making that possible. He depicts, from a point approximately twenty miles up the Homathko River, part of the range of which Mystery Mountain is the culmination, but from this point the mountain's till is seen only as an apparently uninguoriant till is seen only as an apparently uninguoriant.

as een only as an apparently on bold rock which, it now eeem to be assumed, is tiffable as Mystery Mountain. Actually it uite unlike the corresponding face of Myster Mountain, is burely 3000 feet high and ears as Mt. Martello on the map I made owing the 1926 expedition.

Apparently the first time anything appeared in print suggesting that Alfred Waddington's sketch of Mt. Martello was really meant for Mystery Mountain was about a year ago when Mystery Mountain was about a year ago when The Sunday Province published an account of Mr. L. S. Cokely's supposed triangulation of Mystery Mountain; he assumed that his "Mt. Waddington, 11,884 feet," was the same as sketched by Waddington, and that the two were Mystery Mountain, this doubtless being the basis for suggesting the name of "Mt. Waddington." ton.

Nearly a year ago I pointed out to the surveyor-general's department that there were no high peaks near the location given for "Mt. Waddington" and that Mystery Mountain was appoximately eight miles north. It is rather interesting that my figures were correct to within less than a mile, and only 1 per cent. in error as to height, when several surveyors were much wider of the mark or had failed altogether, persistent clouds being one of their great handicaps.

subject, perhaps it out of place to correct a statement in an article appearing under my name in The Province last October relating my party's last attempt on Mystery Mountain. I said with regard to Mr. J. Davidson, B.C.L.S., "his only error was in mistaking a lesser but formidable lone peak for the monarch of them all." I understand that the information I was given on this other mountain was at fault in connecting it with Mystery Mountain at all, and Mr. Davidson informs me he never secured sufficient information to attempt to calculate the height or position of Mystery Mountain, which he always believed to be a very high peak, even in the past when so much ridicule was the lot of the climber and surveyor alike who had the temerity to talkout of place to correct a statement in an artic when so much ridicule was the lot of the climber and surveyor alike who had the temerity to talk of the Coast Range possessing the highest peak in British Columbia. But in view of the number of highly-qualified surveyors who have been baffled by Mystery Mountain, I am sure my reference to Mr. Davidson was never interpreted by anybody as a serious reflection on a man of his standing in his profession.

347 Twenty-seventh DON MUNDAY. street east, North Vancouver.

Munday's letter to The Province, January 22, 1928, substantiates that Waddington had nothing to do with (nor had mapped it as others had stated) the mountain that was to bear his name.



Front Page News. Left: News reports of their attempt in 1927, which ended in an epic battle for survival in a lightning storm on a high point they named "Fireworks Peak". Note the convoluted terrain guarding the peak. Right: report of their ascent of the northwest summit in 1928. The main summit was still, of course, "unconquered" until 1936.



Tools and techniques of the Don and Phyllis Munday.

Tools of the Trade

Skills and tools—machete, long ice axe, skis -that the Munday's had mastered were essential in their approach and many climbs in the region, but they were insufficient for a long alpine mountain rock climb like Mount Mystery. Chasms were crossed with engineering prowess using felled trees, glaciers were traversed with expert roping, and steep ice faces were ascended in nailed boots and chopped steps, but even though the Mundays were also bold on rock, the steep buttresses and faces of Mount Waddington required climbers who had practiced and acquired more advanced rock anchoring skills and tools.

The Mundays and the B.C. Mountaineering Club were generous with providing assistance and information to the visiting climbing teams that came to try their luck on Mount Waddington. Henry Hall of the American Alpine Club initially believed the solution was from the north to gain the southeast ridge, but after three forays between 1931-1934, finally deemed the rock tower of the main summit "next to unclimbable". A Canadian team from Winnepeg (Ferris Neave, Roger Neave and

Campbell Secord) also approached from the north, and armed with pitons (perhaps only used for retreat), came within a few hundred metres to the summit via the southeast ridge in 1934, but were thwarted by the final headwall. The same year, Alec Dagleish died on the southeast ridge after approaching from the south; meanwhile, Norman Watson, E.B. Beauman, and the Chamonix guide Camille Couttet crossed the range from north to south on skis. The mountain was deemed impossible by most who had seen it, and several teams were content to repeat the route to the northwest summit, and the preferred approach became the route from Knight Inlet, as the thick bush initially cut by the Mundays in 1927 (a cabin was also built near Saffron Creek) had by now become a "usable trail" to approach the Franklin glacier and the mountain's southern ramparts.

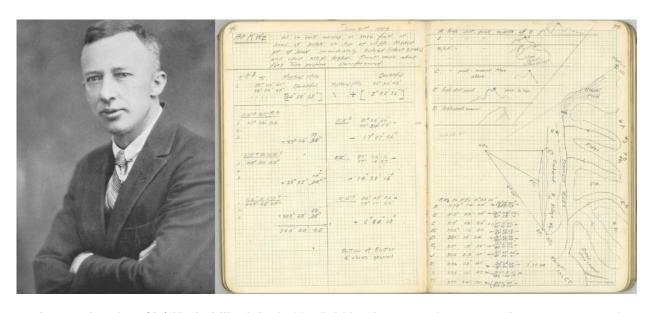


Phyllis Munday and her 1998 Canadian 217 postage stamp.

More Images (part 1)

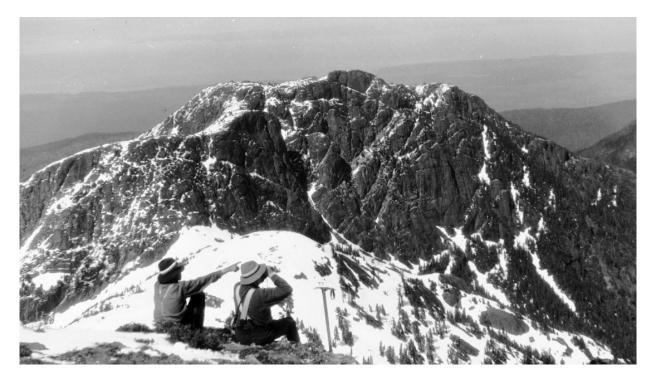


full survey plan of JT Underhill's triangulation of Mount Waddington.



James Theodore (JT) Underhill original 1927 field book pages of survey and measurement of Mount Waddinton's height at 13.260'. Courtesy Chris Cryderman, who notes that JT was "something of a mountain goat", and had fought in WWI at Galipoli. Chris also notes that the Surveyor General records have letters from A.O. Wheeler demanding to see JT's field notes, and "a little miffed at Mount Robson being topped by Waddington. He confirmed JT was right."

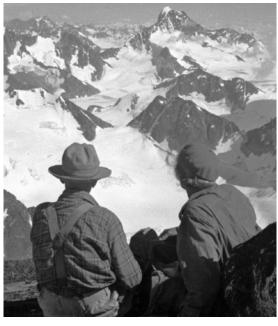
Pics of the Mundays...



"you reckon that's Mystery Mountain?"



"hmm, which summit is higher?"



"what if ...?" (Mount Queen Bess)

MYSTERY MOUNTAIN. TWO YEARS REQUIRED TO CLIMB

THE MOUNTAIN OF MYSTERY

Enormous interest has been aroused by the announcement that the Royal Geographical society contemplates fitting out an expedition to attempt the ascent of Mount Everest in the Himalayas. For not only is this the highest mountain on the globe; but it is also the world's mystery mountain.

Although it was discovered seventy years ago, no European has yet succeeded in getting anywhere nearer than about fifty miles to it, much less setting foot on its slopes.

This is because it so happens that it is situated partly in Nepal and partly in Tibet, and the governments of both these countries object to the presence of European explorers.

Besides this the Nepal base of the giant mountain is in any case practically unapproachable, owing to the important to us than a neighbor's loss dense jungle growth, extending for a of his farm.

with of sixty or seventy miles around, and into whose depths white man may venture and live.

The proposal now is to attempt the ascent from the Tibetian side. This is doubtless possible but whether the summit can be reached or not is another matter.

Most experts say not, and point the fact that the Duke of the Abruzzi's attempt to scale Mount Goodwin-Austin Everest's mighty neighbor, and the second highest peak in the world, resulted in failure.

He ascended as far as 24,600 feet, but was then obliged to turn back owing to the difficulty of breathing, due to the extreme rarefaction of the Mount Everest is more than air. 29,000 feet high.

The world will never progress as fast as it might along Christian lines, as long as our own headache is more

In 1920, Everest was considered a Mountain of Mystery due to the fact that "no European has yet succeeded getting anywhere nearer than about fifty miles to it, much less setting foot on its slopes." (US and UK newspapers). The location and elevation of Mount Everest/ Qomolangma/Sagarmatha were well-known since 1856 from distant triangulation surveys (the Trigonometrical Survey of India, 1802-1871).

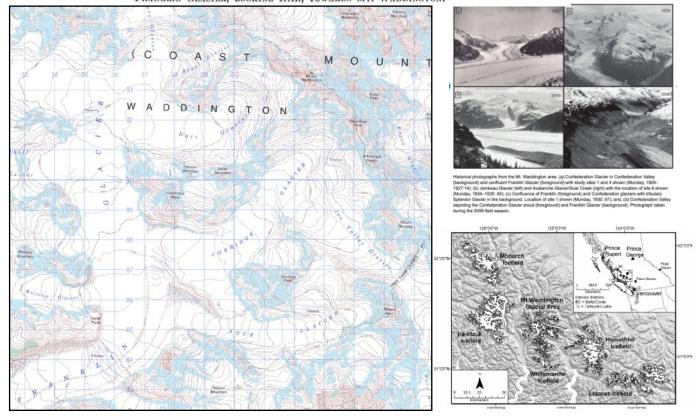


Left: This moving pictures series from Vitagraph in 1919, one of the earliest film studios, was also marketed as "Mystery Mountain". Right: Another popular series from 1934.

Thanks to Don Serl (noted Mount Waddington expert), Anders Ourum (honourary member, BCMC) and Chris Cryderman (of J.T.Underhill Geomatics) for revisions to Mount Waddington research.



Photo, Royal Canadian Air Force.]
Franklin Glacier, looking N.E., towards Mt. Waddington.



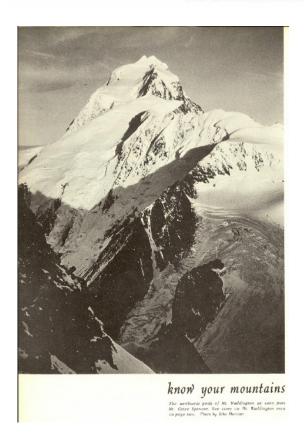
Current 1:50000 topo map.

dwindling glaciers...

More Mountain of Mystery...



Mt. Waddington from Icefall Point, 1936.



Snowshoe route to the NW summit, view from Mount Spencer (Summit Magazine, 1967)



In 1935, Sierra Club Members climbed the northwest peak of Mount Waddington capturing this iconic photo of the main summit.

Sierra Club attempts, 1935-1936

After climbing the 'impossible' summits of the Cathedral Spires in Yosemite, the Sierra Club rock climbers heard of the Mount Waddington attempts. Richard Leonard reflected, "After we read in the newspaper that some British and Canadian climbers had been trying to climb Mt. Waddington, the highest peak of provincial Canada—they had made ten attempts, and all ten had failed. So we said, 'Gee, it is time that we went.' It was a rock climb, so we figured we could rock climb there as well as anywhere else."

A team of eight was assembled for the challenge: Bestor Robinson, Jules Eichorn, Richard Leonard, David Brower, Jack Riegelhuth, Don Woods, Bob Ratcliff, and Bill 'Farnie' Loomis (the latter from the Harvard Mountaineering Club). While their Sierra Nevada climbs had honed their rock climbing skills in high alpine conditions, they soon realized that the Coast Range's rugged and glaciated mountains posed a significantly greater level of remoteness and exposure to risk. Leonard describes the first attempt in 1935: "We had to go up a twentyfive-mile glacier, starting at three feet below sea level. We had a seaplane and got out of the plane in salt water and started the climb up this twenty-five-mile glacier to reach the snow summit at 13,000 feet. At that point, a very severe storm came in, and we had to

retreat in the blizzard because of avalanches and couldn't make the rock summit." The 1930s marked a period of significant expeditions in the Himalayas, following the first attempt at Everest in 1922, and perhaps inspired by the progression of larger teams as a key strategy for the 'big jobs', the 1935 Sierra Club attempt of Mystery Mountain was tooled up to the gills. Bestor Robinson lists some of the 800 pounds (363kg.) of equipment the team loaded onto two floatplanes to fly them to Knight Inlet: "There were one hundred and twenty pitons, seven hundred feet of rope, carabiners, piton hammers, crampons, ice axes, snowshoes, tents, sleeping bags and the hundreds of other items necessary for a self-sufficient expedition." The team planned for three weeks in the range, with a daily food ration of 2.5 pounds (1.1 kg) per person. 103

The Sierra Club rock climbers were unabashed in their reliance on pitons, having climbed the Higher Cathedral Spire in 1934 with a rack of 55 pitons and 13 carabiners. The 120 pitons they packed for their Mount Waddington expedition signaled their expectation for even greater difficulties and considerable aid. Their climbs in Yosemite had required only short sections of aid, but the Coast Range terrain was less familiar. As team leader Bestor Robinson noted, "The Bavarian two-rope technique for overhangs, pitons for direct aid, rope traverses, and other phases of technical rock climbing will probably be necessary."

¹⁰³ footnote: Robinson also relates how Jack Riegelhuth employed the tried and true technique of carrying heavy hardware on one's person to avoid baggage limits for the Canadian Airways flight, a technique of many future expeditions.

¹⁰⁴footnote: For the "Bavarian two-rope technique" see Volume 1--the two-rope system basically uses one rope held in tension by the belayer to hold the climber in position while placing the next piton as the winch point for the second rope. Variously called the "Munich technique" and a number of less polite names. Single-step aid ladders were sometimes used (or a sling), but multi-step aid ladders used in Europe had not yet become a "Yosemite technique." Mild-steel pitons were often removed for future use, but often did get fixed in the hard Yosemite granite. In the gneissic-schist of Waddington, the soft steel pitons would have been more easily removable (mostly because the placements are generally not as solid). To compare, the initial 250m of steep overhanging limestone of Cima Grande required 75 pitons in 1933, where big aid climbs had advanced much earlier than in North America.

The Sierra Club team's vision of a direct line up the south wall was daring, but it wasn't their expectation of a hard aid route and a large rack of pitons that was their undoing. Granted, there were only short spells of decent weather during their attempts in early July 1935, but they made some critical errors in strategy. They established their base camp low on the eastern side of the Dais Glacier, 6000 feet (1800m) lower than the summit, requiring an initial 3000-foot ascent up the Dais icefall to the base of the rock for each attempt, likely requiring a bivouac and extended periods of decent weather. More critically, they opted for relatively safer and steeper rock lines directly up the south wall, rather than risking the snow and ice couloirs on either side in order to quickly gain the upper headwalls. After several attempts, thwarted by weather and time, five members of the team snowshoed up to the NW summit, their high point for the year.

The next year, the Sierra Club was back, this time a combined expedition with the British Columbia Mountaineering Club comprised of 15 people¹⁰⁵. With 1200 pounds (545kg.) of food and equipment, and multiple teams trying various lines, they were no more successful in 1936. The first ascent would require a more lightweight alpine approach, a smaller kit of climbing gear, and the willingness to accept additional risk.¹⁰⁶

In 1975, Richard Leonard reflected on the Sierra Club attempts: The easiest way to climb that side of the mountain was up what they call a couloir or gulley--a chute 3,000 feet long at an angle of about 65 degrees. Any rock or ice would come down that gulley so fast that you couldn't even see it. It would zoom, zoom, as it went by. We stayed out of it because we decided that it wasn't safe. There was nothing you could do about those falling rocks except not to be where they were. That is why we stayed out on the steep ridges, but the climbing was so slow that we weren't able to make it. Another

105 footnote: Under the joint leadership of Bestor Robinson (Sierra Club) and William Dobson (BCMC), members from the Sierra Club on the 1936 attempt included Jack Riegelhuth, Kenneth Adam, Hervey Voge, Bestor Robinson, Richard M. Leonard, and Raffi Bedayan. From the BC Mountaineers: William Dobson, James Irving, Elliot Henderson, and William Taylor. Lawrence Grassi, of the Alpine Club of Canada, was also on the team. Kenneth Austin, Denver Gillen, and Donald Baker from Vancouver worked as packers. Arthur Mayse, a reporter from the Vancouver Province also accompanied the team, along with twelve carrier pigeons to relay information to Vancouver (In an interview with Dougald MacDonald in Climbing 87, Bill House later said of the pigeons, "I don't think any of them made it"). Anders Ourum notes that the BCMC president Roy Howard, in exchange for the help he provided to the Sierra Club, received "a whole bunch of carabiners and pitons. I was probably the first in the mountaineering club to use pitons." (Anders also notes that Mount Fairweather is actually the highest point in provincial Canada, being half in B.C.)

106 Footnote by Don Serl on the 1936 season and Sierra Club/BCMC attempts: "I reckon it can be summed up in two words: "too early". The old timers ALWAYS went into the Coast Mountains too early. The weather in June and early July is (and was) very unsettled, actually with fewer hours of sunshine in Vancouver in June than In May, despite longer days. Plus the temps are higher in June and early July, so the snow (which continues to accumulate in poor weather) is busy falling off everything steep, and turning into deep slop on lower angled surfaces. Early July is perhaps the WORST time in the entire year to be climbing the high peaks in the Waddington Range, but the early parties did it again and again. The SCB group threw themselves into this cauldron of despair in early July. That some of them scraped up the NW summit was a 'just barely' moment, as demonstrated by the failure of the other half of the party the following morning. The weather ALWAYS gets better in the Coast Mtns around July 15 – 20. Witness: Weissner-House: July 21, 1936. Followed by: Beckey brothers: August 6, 1942. Conditions dictate success or failure. And weather dictates conditions."

party from the American Alpine Club made it the same year we were there. They climbed up the dangerous route and had a very

severe rock fall during the dark: they couldn't see it either and were just lucky they weren't hit. 107



Close-up of the 1934 Munday map. Icefall Point (at timberline) was the first staging area for attempts at Mount Waddington, then basecamp on the Dias Glacier. Don Serl: "The best route from Icefall Point angles rightwards across the Franklin, then avoids upper icefall problems by crossing the rocks west of Squire and Cavalier. Once you drop to the Dais, there are acres of flat ground to camp upon. Modern parties almost always basecamp on the north side of the glacier, just south of the Dais – Regal – Fury junction." In 1935, Robinson reports the "two-mile wide Franklin Glacier tumbled at a rate of fifteen feet a day down a thousand-foot ice-fall."

¹⁰⁷ Footnote: From Wiessner's point of view, after his and House's successful ascent, the risks were calculated: Under no conditions would I abandon the principles of 'safety first' and would never indulge in an uneven match with objective dangers, no matter how desirable the goal might be. (1937 Alpine Journal).

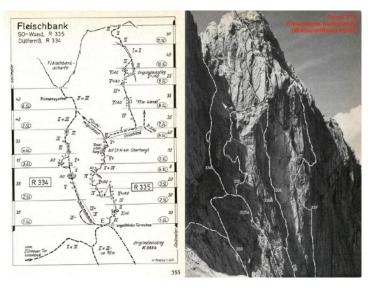


Fritz Wiessner (Summit Magazine, 1989)

Enter Wiessner/House team

Fritz Wiessner (1900-1988) needs no introduction to students of American climbing, who established many of the hardest climbs on the crags of the East Coast in the 1930s, including the third major line up Cannon cliff in 1933 and the first route in the Shawangunks (Old Route in Millbrook) in 1935 often demonstrating the expert use of pitons to protect bold free climbing. Prior to his immigration to the USA in 1929, his level of climbing on the sandstone cliffs near his hometown of Dresden (see Oliver Perry/

Elbsandsteingebirge notes in Volume 1) was several grades above the USA standard at the time (~5.9 vs ~5.7, though not always comparable as styles varied and human assistance was not considered aid). Also in his repertoire of experience were some of the longest mostly free walls in Europe, and a bold early attempt on Nanga Parbat on the joint American-German expedition of 1932 reaching 23,200' (7070m). In the 1930s, Wiessner was developing new alpine ski waxes and was a member of the American Alpine Club, based in New York.



Fritz Wiessner's 1925 route on the Fleischbank in the Kaisergebirge with Roland Rossi (route 335). Even into the 1970s, his climbs were still considered the testpieces of the grade (V+) and referenced in every German Alpine Club guidebook. Many of the pitons shown on this 1978 topo were added after the first ascent.



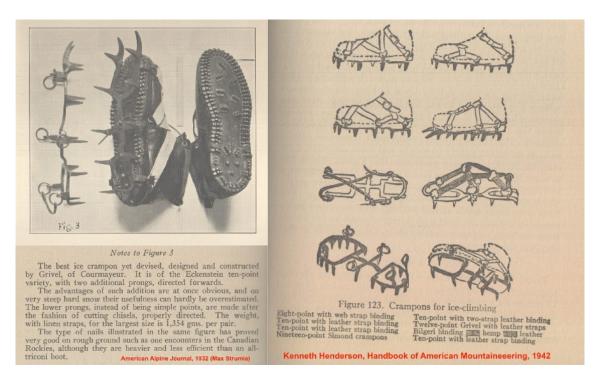
1932 Nanga Parbat German-American attempt (Himalayan Journal, 1933). The two Americans on the nine-person team (plus many locals) were Rand Herron (born in Italy) and Elizabeth Knowlton (as the expedition media correspondent and later author of The Naked Mountain, 1933). Wiessner was still a German citizen (he gained US Citizenship later in 1935). Herron was the first American to take part in a major 8000m climbing expedition; sadly, he died running down the Second Pyramid in Egypt while visiting Cairo on his way home.

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William Penrose House (1913-1997)

Bill House, 13 years Wiessner's junior, was a young protégé. Born in Pittsburgh, as a teenager he climbed (with a guide) the Dents du Midi in Switzerland during a family holiday, soloed cliffs near his high school (Choate), and in 1932, climbed the Grand Teton, which by this time had become a rite of passage for American climbers. While

studying at Yale, he became well-versed in nighttime building climbing (inspired by the post-curfew British university 'roof climbing' tradition), and in March 1934 journeyed into Huntington's Ravine in New Hampshire for the coveted second ascent of Pinnacle Gulley with Alan Willcox, then considered one of the hardest ice climbs in the East. On Pinnacle Gulley, House and Willcox chopped the initial steps in the ice one day and completed the route the next.¹⁰⁸



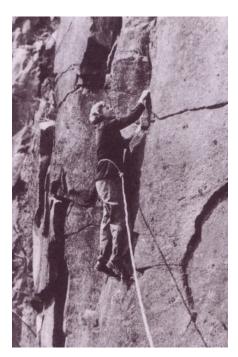
Footnote image: Front-point crampons took a long time for to catch on. Max Strumia noted the obvious advantages in the 1932 AAJ (left), and Miriam O'Brien also had returned from Europe with photos of the new crampon design (see Miriam O'Brien chapter), but well into the 1940s many American and Canadian climbers persisted in arduously chopping steps on steep ice climbs (right image from 1942 Handbook of American Mountaineering, the most complete technique book published in North America at the time). Front point crampons were essential tools for the first ascent of the north wall of the Eiger in 1938 (see Volume 1).

¹⁰⁸ Footnote: The first ascent four years prior, by two novice climbers from Yale in 1930 (mentored by Willcox), required 5.5 hours of step-cutting and was considered 'beginners luck' by the more experienced climbers. As an interesting delay in technology acceptance, even though front-point crampons had been developed in Europe, well into the 1940s East Coast climbers chopped steps (rather than front-point) to ascend steep ice climbs. The availability or reliability of the early models might have been factors. In 1978, Thom Engelbach and I soloed the route with front-point crampons in about an hour or so (see winter pics of Pinnacle Gulley earlier in this volume).



Colorado's Jagged Mountain (13,824'), the most interesting, difficult, and 'needly' of the San Juan Needles, its south wall climbed by Bill House and Betty Woolsey in 1934. In Lavender's 1933 guide, he notes the peak as unclimbed (he climbed a line of least resistance later that season) noting the possibilities of a technical route up the south wall. Photo: Roof of the Rockies, by William Bueler.

In July 1934, House traveled to Colorado with Betty Woolsey (1908-1997), another top East Coast rock climber (and future captain of America's first women's Olympic ski team), and climbed a new route on Jagged Mountain in the San Juan Needles, a technical cutting-edge alpine rock climb. In this developing age of American piton-protected climbing, in 1933 Woolsey and Willcox also climbed difficult technical rock routes in the Wyoming Bighorns. In 1935, House, Woolsey, and Willcox began planning a trip to Canada's Coast Range, and in May 1936, the elder Fritz Wiessner, who had climbed with the young talent on Connecticut's traprock cliffs, joined the crew and they soon set out for the great 'unsolved problem' of the decade, the mountain of mystery, representing the American Alpine Club (AAC).



Elizabeth (Betty) Woolsey at Mount Carmel. Connecticut. Woolsey (1908-1997), a Vassar graduate is considered "the most prominent woman climber" of the East Coast in the 1930s by the historians Laura and Guy Waterman. Photo by Bill House.

1936 Ascent of Mount Waddington

The AAC team planned for six weeks, with 700 pounds (320kg.) of equipment, including a (relatively) lightweight rack of 18 pitons, 8 carabiners, two piton hammers, a 35-meterlong lead rope (noted as a "supple" German rope), a 90-meter-long 8mm diameter rappel line, two pairs of ten-point crampons, ice axes, nailed boots, and Wiessner's ropesoled Kletterschuhe (protection from falling ice and rock comprised of handkerchiefs and scarves stuffed in their caps). Perhaps with better seasonal weather intuition, they began their approach from Knight Inlet on July 3, and by July 19, had established an advanced camp at 10,700' on the upper basin of the Dais Glacier (above the icefall and directly below the SW face). As they were setting up their advanced camp the Sierra Club/BCMC expedition—three teams of three climbers each—were at the end of their attempts at two different routes on the south face, thwarted by weather and difficulties of their chosen lines. Some of the potential lines had been eliminated as options, but a feasible route up Mystery Mountain had yet to be discovered.

It was decided House and Wiessner would reconnoiter the main couloir between the two summits the next day, while Woolsey and Willcox "generously offered their assistance in establishing and supplying our high camp" for future attempts (Wiessner, AJ 1937). Their first nine-hour foray proved fruitless, as the last few hundred feet to the summit was steep rock "impossibly sheathed with ice." Woolsey and Willcox 'had not thought they would climb (the next morning), so had not reached the high camp until well into the morning" (House, AAJ 1937). On July 21, at 2:45am, House and Wiessner began climbing the more dangerous right-hand couloir, finding a left branch, "unimposing at first glance, but cutting up high into the upper part of the face." It turned out to be the key to the

route, and by 7am they had escaped the danger of the gulley and made it to the central triangular snowpatch, with 300m of buttressed rock rising above to the summit.

With expert route finding, free climbing at the highest standard, and favorable weather, Wiessner led most of the steep rock climbing on the upper part of the route, while House followed with a heavy pack, and after 13 hours of technical climbing, the pair arrived Mystery Mountain's elusive summit, a narrow corniced ridge of snow with only room for one. The descent took another 10 hours, requiring all their skill, pitons, and slings, proving to be the most dangerous part of the climb, at one point narrowly missing "whirring and crashing" rockfall. Within 24 hours of leaving their high camp, they returned, heartily greeted by Woolsey and Willcox with hot drinks in hand. Woolsey and Willcox's disappointment "at their not being in on the final climb was somewhat mitigated by the realization that two was probably the maximum advisable on our route-more than two would have been much slower and infinitely more dangerous." (House, AAJ 1937).





House and Wiessner on the summit of Mystery Mountain, July 21, 1936.



House and Wiessner upon their return from the summit of Mount Waddington, photo by Betty Woolsey.





A line is visualised and created. Left: 1937 Alpine Journal. Right: Illustrated London News, September 5, 1936. Photos by Betty Woolsey.

Fair means evolves

In the British Alpine Journal, Wiessner summarises the technical achievement, justifying the use of pitons for ascent and for roping down (as some still considered fair means depended on downclimbing rather than rappelling):

"Artificial means of overcoming the technical difficulties were not required during the ascent; pitons were used only to secure good belays on platforms and on four occasions between stances so as to give the leader a safer belay over the most difficult parts. Of course the climb could be made without the use of pitons should the party object to their use as a matter of principle, but I feel that this would reduce the margin of safety to an unjustifiable degree. As for roping down, this might be eliminated should the party be opposed to such procedure and if it be strong enough and can spend the additional time."

Mystery Mountain once seemed impossible, yet a strong team with broad experience and a commitment to fast and light proved otherwise. The ascent marks a significant milestone in North American climbing, perhaps a key turning point in the ongoing debate between pure traditional alpine





Two photos of Fritz, 50 years apart.

climbing (without pitons) and the more technical tools and techniques imported from Eastern Europe. Wiessner and House's impressive achievement, climbing the mountain all free in a day with 18 pitons and calculated risks, bridged a divide between the two camps and inspired climbers around the world. The success on Mount Waddington demonstrated the importance of appropriate tool use and helped refine ideal strategies for alpine wall climbing, paving the way for future generations of climbers to push the boundaries of what was possible.



The iconic image of Mount Waddington in Richard M. Leonard photograph collection of rock climbing techniques [BANC PIC 1971.107--PIC, The Bancroft Library, University of California, Berkeley.] (credited to David Brower in SCB 1936)

Appendix: Bill House Pitons

In an interview with Dougald MacDonald published in Climbing in 1984, Bill House remembered having his own pitons made: "We had pitons. We had to have them made at a blacksmith, but we knew what they looked like and could tell him." In the 1930s, European climbing technique books were circulating with images of pitons, and climbers who had visited the Eastern Alps would have been familiar with similar vertical and horizontal piton designs. The two Bill House pitons below have a very large eye compared to modern pitons and would have accepted thick rope rings as a way to attach to the running belay (in lieu of a carabiner).

1937 Piton found by author on Shiprock (story to come):



A piece of 'unbent iron' (steel) from the original attempt of the North Tower of Shiprock in 1937 by William House, Robert Ormes, Gordon Williams, and Bill Griffiths.

Jack Tackle Mount Waddington Piton

Jack writes, "In 1977, we climbed a lot of the same terrain as Wiessner and House, I would say that they did have a fair amount of wet rock above the triangular snow patch-which is still 1200 ft below the summit- it has another smaller snow feature above it. What Ken and I did as a new major variation was 5.9 rock and WI4 climbing to get to the upper snow patch-House and Wiessner had gone out left on the much easier ground- but above that last snow patch is where our route crossed and I found this piton maybe 3-4 pitches below the summit on solid 5.8 climbing."

Don Serl Mount Waddington Piton

Don writes, "I retrieved this piton from the SW face of Waddington, that during the attempt by Joe Bajan and I to climb the route in the winter. I now see that the initials are a stylized 'PH', for Penrose House! This too is a Bill House piton, from the first ascent."



Jack and his prized Bill House piton.



Horizontal Bill House Piton from Jack Tackle collection, found on the Wiessner/House route on Mount Waddington. A very well-made piton with large eye, suitable for a large diameter rope-ring, with the initials PH scratched on the surface (Bill House's middle name was Penrose). Very likely one of the pitons referenced by House as being custom made by a blacksmith perhaps and if in the USA it would be a very early example of an American-made horizontal piton, with solid hitting surface and offset eye, though it is possible these might have been custom-made in Switzerland.



Vertical Bill House Piton from Don Serl's collection, also retrieved from Mount Waddington, marked "PH". Bill House had both vertical and horizontal piton designs.



Bill House gave this piton to Dougald MacDonald during his interview with Bill in 1984, with WH (William House) clearly stamped. This European piton has stumped the experts, markings appear as "Marke Steinbock International". See also Karabin Climbing Museum.



At the time, there was also a heated debate on the equipping of pitons for Himalayan expeditions, and the success and experience on Mount Waddington was influential on the initial 1938 and 1939 attempts and strategies on K2. Bill House was also involved with gear production, helping design and test some of the first aluminum carabiners for the U.S. Army in 1941, and was instrumental in the design and manufacture of the first nylon ropes. After WW2, House chaired the AAC Safety Committee and was the lead signatory on "The Need for a National Mountaineering Safety Program," which began the AAC's annual Accidents in North American Mountaineering journal in 1948.

Explorer From Pittsburgh Shows Movies Of Expedition to Second Highest Mountain. William Pendleton House, who, the air, especially when that some-

The new generation...

In the Alpine Journal report on Mount Waddington, Wiessner offered advice for future aspirants: "From what I saw of the mountain, I believe that our route is the best and safest way of attaining the summit. However, there are other distinct possibilities. For example, one might find an easier line over the final rocks by going somewhat to the right, S.E., of our route providing traverses can be made round several great overhangs."



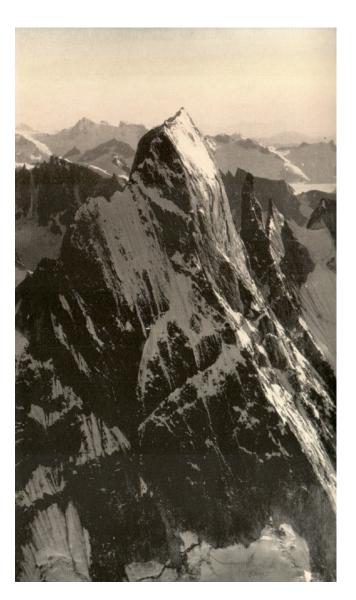
In 1942, Fred and Helmy Beckey took an alternate route on the final section on the second ascent of Mount Waddington, described by Wiessner as a possibility. 'X' marks the spot of a bivouac on the descent, 150' below the summit, "anchored to pitons, only a can of sterno and a reliable tentsack kept away the cold."

On the second ascent of Mount Waddington in 1942, Helmy and Fred Beckey took the right line at the final rocks, which involved 300 feet of difficult exposed climbing with overhangs and requiring "many pitons". The brothers had cut their teeth on technical routes in the North Cascades, including the west ridge of Forbidden Peak in 1940, a 'great obelisk of rock', and the Mushroom Tower in 1942, involving climbing harder than anything on Waddington. The young teenagers' ascent of Waddington (Helmy turned 17 on the ascent, and Fred was 19 at the time) challenged the traditional expectations of experience. After their ascent of Mount Waddington, the brothers' paths diverged--Helmy's climbing career peaked in 1941 with the first ascent of the South Tower of Howser Tower, while Fred went on to become America's most prolific climber, pushing new standards for decades and climbing year around until he was 94.

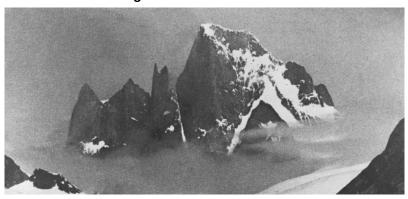
In 1946, Fred teamed up with Fritz for a for an ascent of the unclimbed Devil's Thumb, but Wiessner twisted his knee on the approach and the team changed to Clifford Schmidtke, Bob Craig, and Fred.Their successful first ascent of the Devil's Thumb via the east ridge was perhaps the most difficult climb of the 1940s, and a cumulation hard-earned experience on long high alpine piton-protected rock climbs.



Fred Beckey and Fritz Wiessner on the way to Devil's Thumb, 1946.

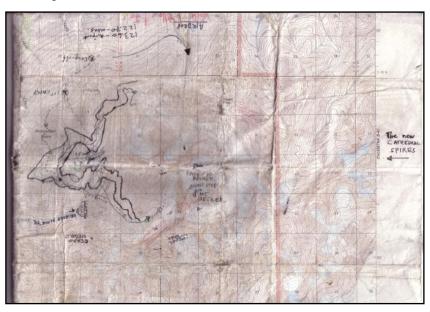


East Ridge of Devil's Thumb in Western Canada.

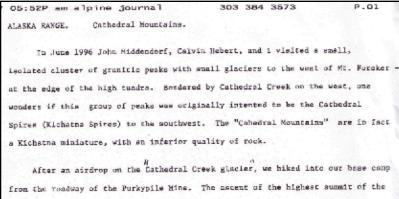


Devil's Thumb. The double-peaked spire is called Cat's Ears Spire and was first climbed in 1972. The two peaks on left are called the Witch's Tits.

Trips with Fred in the 1990s



Map for Mount Beckey in Alaska. Fred, Calvin Hebert and I climbed the highest peak in this sub-range which Fred and researched and believed was the original "Cathedral Spires". We climbed it as a team of three and named it Mount Beckey by majority vote.



After an airdrop on the Cathedral Creek glacier, we hiked late our base camp from the rendway of the Purkypile Mine. The ascent of the highest summit of the peaks (just over 8,500 feet) had an interesting glacier sweep, then a narrow summit show ridge. The crux was a really loose section of flaky rock (class 5.5). Most of the climb was done with light show falling, so the views we expected were limited. The area has some wall-climbing potential, but much smaller than the Kichatnas. Despite the inclement weather, it was a worthy explorative and climbing trip. It seems certain that we were the first climbers to visit these peaks.

Fred Beckey



Fred Beckey on our trip to the Bugaboos.



North and South Howser Towers



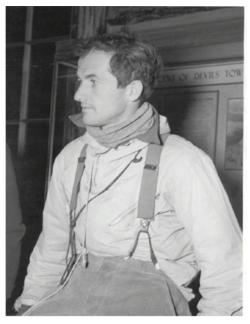
Halfway up a new line on North Howser on a Fred Beckey trip.

More key climbs from the 1930s and 1940s.

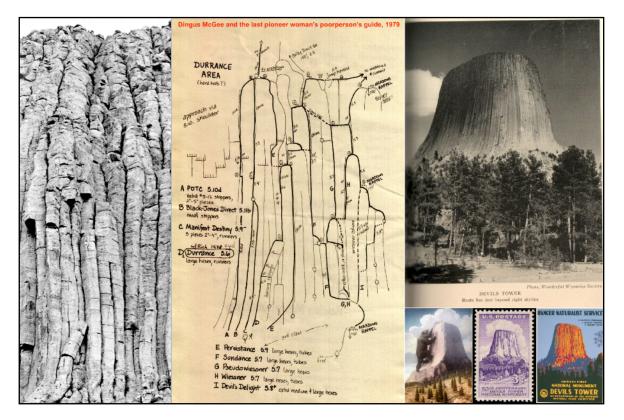
Devils Tower/Mato Tipila

The following year after their Waddington climb, The strong Wiessner/House team, joined by Lawrence Coveney, made the first 'rock climbing' ascent of Devils Tower/Bear's Lodge in June,1937, using only a few thin pitons. A piton was used to brace a courte échelles (shoulder stand) and another used to protect a strenuous crack toward the top, described by House: "Incredibly (Wiessner) kept going, forcing himself up the crack with a power and rhythm that was beautiful to watch."

The next year, Jack Durrance from and Harrison Butterworth free climbed a parallel route to the left, which became the classic (and easiest) Devils Tower route. Durrance and a team of rescuers repeated the route in icy conditions using some aid with wood blocks hammered into the cracks during the famous retrieval of a stranded parachutist, George Hopkins, in October,1941.



Jack Durrance at the Devils
Tower Visitor Center



Prior to the advent of angle pitons, wide cracks were generally chosen as the natural line to free climb, with thin vertical and horizontal pitons in smaller cracks used for protection.

More Devils Tower tidbits.



The original ascent of Devils Tower in 1893 used wood wedges to create a ladder (NPS). The first angle pitons used to protect the wider cracks was not until 1952 on Soler (Herb Conn, Art Lembeck, Ray Moore and Tony Soler), using 24 angle pitons, nylon rope, and US Army surplus aluminum carabiners, an ascent which also saw the first climbing bolt placed on the tower (NPS photo).



Babe White, a "human fly" climbed the remnants of the original 1893 wood aid ladder on Devils Tower in 1927. He died six years later in 1933 performing on a building climb in California.

Devil's Tower Climbed Yesterday By 3 Men Of American Alpine Club

Arthur Jobe, of Lead, Among Those Who Have Conquered (Continued from page of Huge Rock Towe

By CAMILLE YTHLL
VILSE TOWER, Wyo, June 20—
s Tower, until Monday, and save by use of a rope and ladder, has been conquered Wiessner. New York, Lawrence Y, New York, and William P, Pittaurgh, Pa. all members of merican Alpine club, New York and deline club, New York and the characteristic properties of the previous and the ascent up the almost dicular columned lacolith in

living thing seen on top was a Mora grasshopper" which has infested the Bear Lodge this season, they declared. The only evidence that any one else had climbed the tower was the old flagstaff which Ripley and Rogers carried up in sections on that first climb on the Fourth of July,

Evidences of several kind of weathering were present, all very slow, but there was little indication that the columns had been higher on the northeast side and had been weathered down. They found a number of flat stones on top

The first climb was made in 1893. when William Rogers, a cowboy living at the foot of Devil's Tower, made Advertised for days and weeks beforehand, it attracted a large crowd, people coming from as far away as Rapid City, by team and wagon. Rogers and Ripley had spent days constructing the ladder, carrying the small stakes up the tower and pounding them in. Two by fours pounding them in. were nailed to the stakes, thus making a rude sort of a device which has ever since been called a ladder. The climb took place on the Fourth of July.

Two years later. Mrs. Rogers climbed the Tower with her husband again on the Fourth of July. the only woman who has ever been up. W. B. Ogden, formerly of Sundance; Cyril Miller, Ivan Hoffer, L. Wood and Henry Hazelbaker, climbed the Tower, on the ladder after Rogers had come down on that Fourth of July, 1893. Neil MacArthur helped carry material up for Rogers so it is possible that he stood on top at some time.

A rod man in the party of Dr. Herron of the U. S. G. S. made the climb in 1918. His name is unknown but member of the party, Shelby stead, Eugene, Oregon, says he did it. Others who have been on top are T. F. Jolley, Spearfish, Seth Boyer, be treacheous crack had be treacheous crack and the treacheous grasses and shrubs.

Wilkings and a human streacheous crack had be treacheous crack and shrubs.

Wilkings and a human streacheous crack had be treacheous crack in 1900; Henry Nauber in 1905. forced to use the ladder after all. took him the entire day. Rumor has is that he was killed in an accident at San Francisco several years ago.

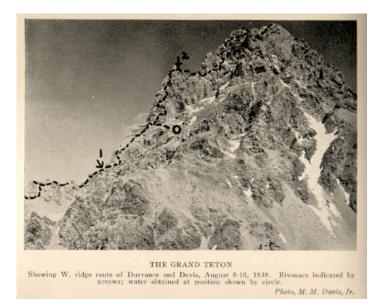
Report of the first climbing ascent in the Lead Daily Call (South Dakota) June 29, 1937. House refers to at least two pitons; the 'single piton' reported perhaps refers to the one used to brace the courte échelles as a point of aid.

Jack Durrance and multi-day rock climbing

Jack Durrance (1912-2003) grew climbing on the limestone walls in the Bavarian Alps, and as a young teenager, was once benighted with "only a shirt" in a snowstorm, and "never went without (proper equipment) after that one." Indeed, his many successful ascents in the Tetons can be attributed to careful planning, heading up on climbs even when the weather was uncertain, by being well prepared for all conditions.

As a pre-med student at Dartmouth College¹⁰⁹, Durrance and fellow Dartmouth climbers pioneered many of the great lines in the Tetons. In 1938 on the west ridge of the Grand Teton, the longest physical feature of the peak, he and Michael Davis spent three days on the route, an early multi-day rock climb in North America.

On the west wall the the Grand Teton in August 1940, he and Henry Coulter took two sleeping bags, a large rubberised cloth bivy sack, a Primus stove and pot, one short ice axe, ten European pitons, 120' linen climbing rope from Plymouth Cordage, and



felt soled climbing shoes. All told over 50 pounds of equipment that sometimes needed to be hauled up separately. Though prepared for anything, the duo climbed it in a long day from Valhalla Canyon with only one short storm slowing them down, and their route became known as one of the most difficult in the range.

Durrance was reticent of his accomplishments, rarely (ever?) writing about his breakthrough climbs. Bigwall climbing had not yet come of age in America in the 1930s, but the climbs and multi-day strategies of Jack Durrance were certainly forerunners of what was to come.



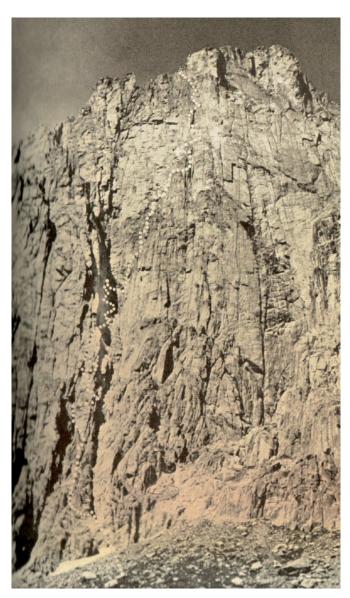


The Grand Teton's direct route from the west was considered the "last remaining problem of the Grand", climbed in 1940.



Durrance in the Tetons

¹⁰⁹ Jack Durrance also added another lvy League climbing club (in addition to the Harvard and Yale clubs) when he helped found the Dartmouth Mountaineering Club (between 1936-1938). Author note: I was elected president of the DMC in the summer of 1980 when I was a sophomore in the engineering program at Dartmouth (but transferred to Stanford University the following term).



Another spectacular Stettner route, the 1200-foot east wall of Monitor Peak, considered the most sustained climb in San Juans and one of the earliest North American multi-day wall climbs (preceding the 1200' Lost Arrow climb in Yosemite by a month). Hardware consisted of twelve pitons (19 placements), six carabiners, two piton hammers, 120' nylon climbing rope, and 30' of 5/16" sling rope. The route including a tricky pendulum, shoulder stands, some aid, and difficult balance climbing. FA: Joe Stettner, Jack Fralick John Speck, August 9-10, 1947. The site of the bivouac 300' below the summit is marked with a cross. Photo H. Lumby.



Bivouac on the narrow ledge high up on the east wall of Monitor Peak, involving a storm through the night. Photo from The Stettner Way, by John D. Gorby.



Equipment used on the east wall of Monitor Peak.
The boots were of Stettner's design, "smooth rubber sole set with nine special hard steel nails, five along the outer edge of the sole and four along the inner edge. This combines the advantages of smooth rubber on dry rock and of nails on grass, mud, wet rock, etc."

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PART 4 NEW TOOLS FOR NEW CLIMBS DEVELOPMENTS TO THE 1950s

Note: Some of the historical climbs in North American history involved trespassing on indigenous lands, such as on the Navajo Nation, which spans three states (Arizona, New Mexico, and Utah) in the Four Corners region of the United States. An important modern commentary from Len Necefer, a Diné climber and engineer with a PhD in public policy, is here: https://climbingzine.com/culture-climbing-interview-len-necefer/ (Climbing's Destructive Past, by Sara Aranda, published in The Climbing Zine, Volume 13). My own missions to the desert, using strategies involving days of reconnaissance, getting to know the area and the people, and often getting direct permission from leaseholders are now considered disrespectful of the autonomy of native lands, which I acknowledge (footnote).

Footnote: In the 1980s I climbed a number of routes within the Navajo Nation, and only vaguely recognized the broader social justice aspects in our quest for natural challenges, in our defiance of all forms of authority that kept us from the natural landscape (as well as big city infrastructure). My encounters on the Navajo Nation were harmonious, and I still have friends in the Tribal nations today. My modus operandi was to drive multi-day solo reconnaissance missions along remote roads in my Toyota Kingcab 4x4 (which was also my home), looking for objectives but also getting to know the lay of the land and the people. I always filled my car with hitchhikers on my way to the Navajo Reservation (as it was known then), which sometimes led to invitations from the Diné leaseholders who had cliffs and towers on their lands. One traveler from Flagstaff for example, who leased the land below a large unclimbed wall on Segeke Butte invited me to his home and pointed to "Half Dome", as it was then known and marked on USGS maps (changed in 2000; the large volcanic plug on the other side of the road, Agathla, was coined "El Capitan" on USGS maps). Len told me to come back anytime to climb it; back in Flagstaff, I told a climbing buddy of the opportunity, who promptly snagged the ascent with another climber ("all's fair" as the saying goes). But I found many other first ascents on the reservation, close to the quantity and quality of the prior "eras" of Layton Kor and the Banditos. Even with access granted (or especially so), I approached climbs with the greatest respect for their sacredness, and avoided formations that were clearly held in the highest regard to remain undisturbed, such as Spider Rock. Others, we discovered parts of cars and other heavy debris on the summits that arrived via helicopter, remnants of commercial television shoots —these we justified as fair game for the first ground-up ascent, though this view, still, disregards the broader issue of native autonomy. I rarely reported my routes to guidebook authors and magazines, though I did sometimes submit brief summaries to Ad Carter, who sent frequent typewritten letters requesting specific info for the American Alpine Journal (I still have no idea how he always knew what was going on). In truth, there was always a bit of the renegade attitude in the most desolate places with no one around for miles, and I recognise the inherent disrespect of these adventures because we also were sensitive and aware of the past transgressions toward the people of this land. But it was impossible not to be drawn to the feeling of sacredness and solitude found within this landscape, and we moved with quiet intent and left without significant trace, often doing major cleanups of found trash at road ends. As a river guide for the Hopi tribe for several years, I was also accepted into the Hopi community and was able to explore a little further. Times have changed, and today it would be out of the question to sneak around the Navajo and Hopi nations, as the cited grey areas justifying access are mere "loopholes that need untelling". Even as late as 2014, during Alex Honnold's and Cedar Wright's second Sufferfest, when Shiprock and seven other towers on the Navajo Nation were climbed, Alex states he did not realise these climbs were forbidden until an interview in 2021. Perhaps someday there will be a way to share these blessings with the tribe.



Typical climbing in the desert: loose holds, up to 5.11 climbing with poor protection, sketchy belays and frequent rockfall. "Helmets? we don't need no stinkin' helmets" was the attitude of the day. Photos by Dave Insley during our 1987 desert adventures.

Loose Rock

In terms of the variety of rocks to climb, America's west is one of the most diverse in the world. A lot of it, especially in the desert, is loose, unconsolidated, and just plain rotten; pure aid climbing techniques are generally ineffective here. Instead, one needs deft and bold free-climbing skills to overcome dangerous sections, often balancing on crumbly holds with a well-calculated distribution of weight.

Albert Ellingwood in 1920, after his first ascent of Lizard Head Spire:

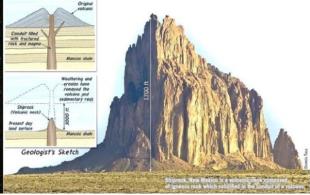
"A rottener mass of rock is inconceivable. Each movement that I made sent down a rattling shower of stones. Needless to say, every hand and foothold had to be tested with the utmost thoroughness. Most of the enticing small holds, crumbled at a touch and large masses of the loosely compacted pebbles would topple dangerously at a slight pull."

Chuck Pratt was much succinct in the 1960s: "Desert climbs are generally short, often requiring less time than the approaches. The rock at its best is brittle and rotten, and at its worst is the consistency of wet sugar."

The loose desert sandstones and volcanic rock challenges brought new ideas to the gear and techniques developed for climbing.





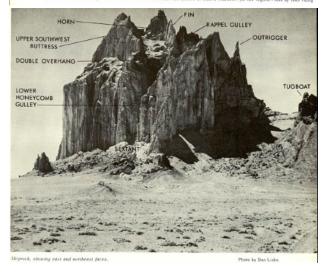


Shiprock, 1939

Rising dramatically from the Colorado Plateau, the 500m volcanic plug called Shiprock has been an irresistible challenge to generations of rock climbers. Shiprock's attempts and first ascent in the 1930s are steeped in lore, including one of the longest falls in early North America climbing, and the use of the "first bolts" on a major rock climbing objective. 110 In the decades after the first ascent, climbers have ascended and named progressively harder routes to its summit and prominent features, often with nautical themes, despite the known legend of the original Navajo name, Tsé Bit'a'í, which refers a pair of winged creatures that once nested on its summit (or perhaps as the winged creature itself, set in stone).

For the Hopi, the Shiprock formation relates to the Aztec ruins (Hoo'ovi) "place of the arrow", and is commonly called Tsukuywa (place of the pointed rock). Tsukuywa is a migration landmark used by the Parrot, Roadrunner and Raven clans during their occupation at Mesa Verde (Tawtoyka) or "place of the singing cliffs" and Chaco Canyon (Yupkoyvi), or the "far away home" (from Clifford Qotsaquahu, 2022).





¹¹⁰ Although it is very unlikely the four bolts placed on the first ascent of Shiprock were the first climbing bolts in North America. Documentation is sparse but there are strong indications that the Sierrans were experimenting with bolts prior to Shiprock--a route in the Pinnacles, for example, by Dick Leonard, Ralph and David Brower in 1934, "Tuff Dome" is recorded in an early guidebook as having a bolt at the start. Other manufactured routes were not considered 'climbs'; i.e. in 1911, John Otto used extensive drilled rods to ascend Independence Monument.

Tales of Our Fathers NAVAJO LEGEND Retold by Will Evans, Shiprock, N. M. ser of wood was never self. A sin of wings hearled the great said wings hearled the great reasons and a Swings lay dead in the reasons and a swings lay dead to be a single he sold the reasons and a swings lay dead to be a single he sold the reasons and a swings lay dead to be a single he sold the swings and the reasons. Some time previous to this colonic he had slint an encorrous since the reasons he had slint an encorrous he hide of the beast was very lack. The Twin peed off enough in hide of the beast was very lack. The Twin peed off enough in hide of the beast was very lack. The Twin peed off enough in hide of the beast was very lack. The Twin peed off enough in hide of the beast was very lack. The Twin peed off enough in hide of the beast was very lack. The Twin peed off enough in the same that t RECIPES

Story of 'Sa-Bit-Tai' in the Tushka Homman, a newspaper 'published in the interest of 350,000 Indians in the United States' May 28, 1936.

An earlier rendition of the Shiprock story (Ascent, 1999, John Middendorf):

The 2500-foot volcanic plug of Shiprock in the New Mexico desert stood as one of the last great mountaineering challenges in the continental US in the late 1930s. Bill Ormes and Bill House attempted the extremely difficult north summit in 1937 via what is now known as the Ormes Rib, on which they encountered difficulties exceeding 5.9. With marginal protection and no way of avoiding the free climbing on aid, their efforts culminated in a long and dangerous fall by Ormes. He retrieved the deformed piton that had finally stopped him, and later wrote an article entitled "A Piece of Bent Iron" in the Saturday Evening Post, offering a warning to those who would push their luck on such severe climbs.

Such warnings often act as incentives, and in 1939 Dave Brower, Raffi Bedayan, John Dyer, and Bestor Robinson set out from Berkeley for Shiprock. Wellversed in the new Yosemite techniques, they were armed with all the latest gear, as well as a secret weapon: a bolt kit. Their ascent up the crazily skewed basalt columns to the fragile and bizarrely shaped tuff-breccia of the upper part of the route was a wild and historic multi-day adventure with difficult aid and free climbing. Avoiding the dangerous Ormes Rib, the team instead rappelled down a gully in the tortured landscape and traversed into the massive interior bowl of the decaying volcanic plug. From here they scrambled easily up to the final crux, a steep, 200-foot step to the summit. After many pitons and a scary lasso over a horn, Shiprock was won And the secret new tool was officially initiated into the climbers' repertoire: the men had placed four bolts. Aware of the controversial nature of what they had accomplished, the four Shiprock climbers selfdeprecatingly called themselves "rock engineers, but this first North American use of drill and bolt marked the dawn of another new age in the history of technologically aided climbing, and new visions of the possible soared. Brower, now an internationally famous conservationist, helped set the precedent of fixing climbing anchors in the wilderness. Could he have known the future implications of his act?

From sacred tower to climbing challenge

The first ascent of Shiprock in 1939 was a milestone that captured national attention, with the American Alpine Journal, the Sierra Club Bulletin, Appalachia, the CMC's Trail and Timberline, as well as many national newspapers and the Saturday Evening Post covering the story. It's one of Roper and Steck's Fifty Classic Climbs (1979), which is still a ticklist for ambitious climbers (last printing 1996). The heroics are well told in these stories, but just as the ascent of Mount Waddington in 1936 left no guestion of the value of the moderate use of pitons to American climbers, the ascent of Shiprock in 1939 using four bolts unleashed the expansion of bolts in rock all over the country, and arguably the world (historians often cite two bolts in the Kaisergebirge in 1946 as the first climbing bolts in Europe). on routes acknowledged as great climbing achievements.

The Colorado climbers been aware of Shiprock for some years, but its national focus as one of "the last great climbing problems" was ignited with a mysterious article in the Appalachian Mountain Club's journal, titled "New Mexico's Challenge to Mountaineers," by Camille Yuille, a South Dakota journalist with no other connection to climbing other than notes and photographs of Devils Tower. It was her only climbing journal article, and she begins her five-page illustrated and detailed enticement with notice of a reward:

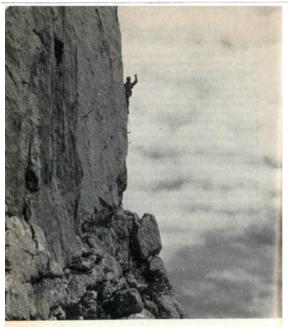
"A substantial sum of money awaits the man or woman who climbs Shiprock, isolated volcanic neck in northwestern New Mexico, and places the United States flag on the summit. The reward was offered several years ago but so far there have been no claimants. Too, a fabulous fortune in jewels and silver awaits the climber, say the Navajo Indians who graze their flocks of sheep and goats at its base."--Appalachia, June 1936

Peak Still Sacred to Navajo Indians



In the heart of New Mexico's Navajo Indian country, Shiprock towers high above the plains, a peak 1,640 feet high which had defied all at-

tempts on the part of skilled climbers to reach the summit. Recently, however, four members of the Sierra club of California successfully reached the top.



Ein Kletterer im oberen Teil der Fleischbank-Südostverschneidung, wenige Meter über dem Grasband. Hier wurden bei der Erstbegehung am 1,2. Juli 1944 durch P. Moser und W. Weiß die ersten zwei Bohrhaken im Kaiser gesetzt – lange bevor der Bohrhaken Ende der 50er Jahre von den sächsischen Kletterern in den Alpen eingeführt wurde.

European climbing bolt origin story (1946): "P. Moser and W. Weiß set the first two bolts in the Kaiser a decade and a half before the Saxon climbers introduced them in the Alps. Surely they wouldn't last long either." (However, see Volume 1 e.g. Le Pére Éternal in 1927.)

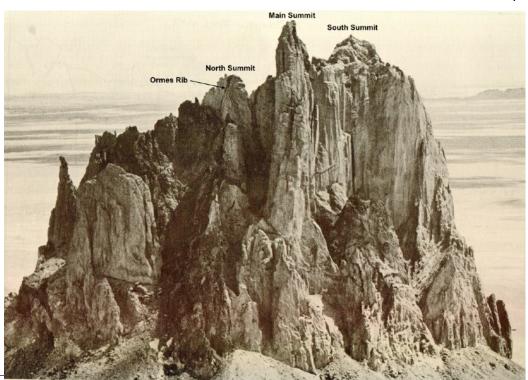
The rumour

The rumour of a reward spread throughout the climbing community, initiating a nationwide rivalry for the summit, with the East Coast climbers, the north and south Californians, and the Colorado climbers all seriously vying for its first ascent. Carleton Long wrote to a Gallup, NM newspaper requesting information on the agency offering the \$500 reward. Other climbers heard about a \$1000 reward from various imagined benefactors.

Mel Griffiths commented, "Because of the rumor, there were undoubtably a great number of climbers, real or feigned, who approached the rock in secrecy, made competent or clumsy efforts to climb it. The tale undoubtedly brought about many unrecorded attempts to climb the peak"111

The big fall

In September 1937, Robert Ormes returned a third time to Shiprock, after having made two exploratory missions in prior years with Dobson West, and believing the key to the main summit was to first climb north summit of the mountain. Ormes was joined by Bill House (a fellow classmate from his year at Yale in 1933), fresh from climbing Devils Tower earlier that summer (and with the most advanced piton technology), along with two other strong Colorado climbers, Gordon Williams and Mel Griffiths. The attempt ended with a big fall (see caption next page), though Ormes and House returned a few days later to their high point to scout an alternate route, and considered the descent down from the Colorado Col to gain access to the Honeycomb Bowl on the other side. Ormes returned in 1938 with another team but made no further progress.



111 There is still the mystery of the one-inch bottle cap discovered high on the route by the first ascentionists ("Shiprock Sunk", Appalachia).. Little also is known of the solo attempt(s) by a Swiss guide, Walter Kiener, who had been working in Rocky National Park and was rumoured to have been crippled (he wasn't) after the rescue and death of Agnes Vaille from freezing in 50 degree F. Conditions during a winter ascent of Long's Peak in 1925.







Photos of the 1937 attempt. Ormes first tried climbing the arete of the rib, gaining ten meters but finding no gear and impossible climbing (left photo). Next, House and Griffith tried the corner and methodically gained height by hammering a piton, fixing to it, and allowing the other climber to leapfrog past with a shoulder stand to place another piton (middle photo). Finally, Ormes free climbed above the last piton, found himself "in a nest of loosely held, rotten rock" and while searching for a piton crack, a foothold broke and he fell eight metres, held by a piton with a karabiner (right photo). The piton was cracked and bent from the forces in the fall, which Ormes retrieved prior to the team's retreat.



Walt Shipley on a very runout lead of Ormes Rib in 1989, with a small clean climbing rack of hexes and stoppers. A fixed piton, considered one of the only reasonable pieces of protection, fell out as he led the 5.10xx pitch. It was the third ascent of the North Tower.



Ormes' tale was told in the Saturday Evening Post. 247

The climbers from Colorado adhered strictly to their ethical code of using pitons solely for safety purposes and not for aid; even though they employed repeated shoulder stands braced by pitons, the upward progress was not considered "direct aid." The tempting path to a successful ascent was calling for different tools and tactics, and the climb would soon fall to climbers with less stringent codes of conduct.

Californians to the fore

Within the nationwide rivalry, the north and south Sierra Club Rock Climbing Sections (RCS) were also in competition for the ascent. Glen Dawson, William Rice, and Bob Briton of the southern RCS tried Shiprock in 1938 using traditional techniques, but got no farther than Ormes and his teams. In the north, Richard Leonard had been collecting volumes of information on Shiprock, and with David Brower and others had been experimenting with expansion bolts in the Pinnacles and on the local crags. After hearing of Ormes' fall, they recreated the experience by taking 20foot falls off an overhang onto a bolt, just as they had done to develop their dynamic belay systems for their ascents of the

Cathedral Spires in Yosemite five years prior. The bolts "passed adequate tests with honors", and with confidence in their choice of masonry bolts coupled with a portable hand drill holder, stellite-tipped rock drills, and hammer, they were ready to introduce the new tools for a major climbing objective.

The team consisted of Bestor Robinson, David Brower, John Dyer, Raffi Bedayan,, and Richard Leonard. The committed negotiator Leonard was to join the team after a five-day National Park Service conference in Santa Fe, but when he finally arrived at Shiprock, the team had already succeeded in their objective after four days of effort fixing ropes and a bivouac in Honeycomb Bowl high up on the route.

The team was equipped with 1400' of rope, 70 pitons of various shapes (54 were placed, 'fully half' used for direct aid), 18 carabiners (3 sizes, including "screw-jawed type for excessive strain"), 2 hammers, and the bolt kit (4 bolts were placed). It was the most technological ascent in North America at the time, and on par in difficulty with the aid routes in Europe such as Cima Grande (see Volume 1), though aid techniques in Europe were more advanced at this time.



1930s expansion bolt catalog pages. The holders and tapered drill systems for hand drilling remained the standard rock climbing bolt drilling tools until the 1980s. The bolts used on Shiprock were 1/2" eyebolts (not shown here), 2" long, with eye big enough for a carabiner.

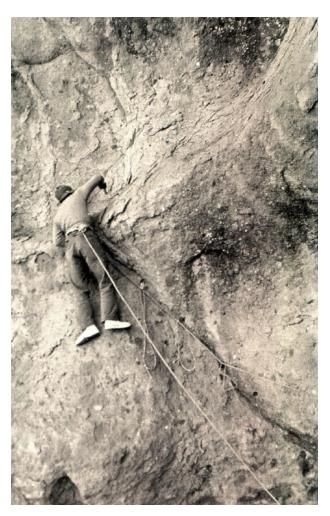
As an extension to the prior "rules" the Shiprock team were carful to note that the expansion bolts were only used for safety (belays and protection) and not for direct aid. The ascent was celebrated, and the bolt was now envisioned as an acceptable tool for many climbers in North America.

The self-professed 'proud rock Engineer' Bestor Robinson wrote articles of the climb for the American Alpine Journal and the Sierra Club Bulletin, expressing no reservations about either the aid or the bolts, stating his defiant posture the AAJ:

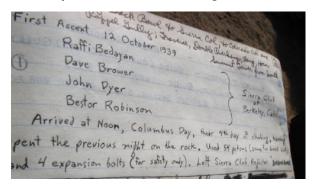
I'm a rock engineer and proud of it. I climb mountains for the same reason that the purists do, because of the sheer joy of accomplishing the difficult. To use pitons for direct aid on a pitch that can be climbed without is to destroy the difficulty that is the basis of the sport. But show me the man who has hung over space suspended by a chest loop from a piton, meanwhile searching for a narrow crack that will admit another, all the while squirming into a position that will enable him to swing the pesky hammer and trying not to get tangled in his ropes -show me such a man who has led real overhangs on pitons which he has put in and you will find an enthusiast for rock engineering who will tell you that such a job is more difficult than climbing a Mummery crack.

Let us be tolerant of differences in taste. Let us drop this childish prattle about the immorality of artificial aides. If some climbers really wish to eschew all artificial aides, let them abandon ropes and shoes for surely these are products of a mechanized society. Let them establish a "Nudist Climbing Club" if that is the way they enjoy climbing, and let the rest of us who like our gear and gadgets be tolerant of them so long as they do not actually interfere with our pleasure in climbing.

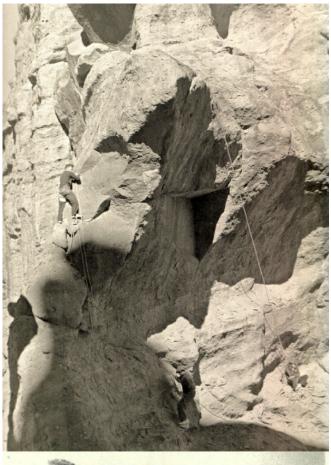
Indeed, arguments of this 'go naked' type would prevail with the introduction of all sorts of new tools over the following decades.



Bestor Robinson using the technique of using loops of rope as steps on each point of aid on the "first overhang" pitch. This section required multiple changeovers and took all day, despite being only twelve feet of climbing using six pitons and a bolt. The 'second overhang' took an hour and was also topped with a safety bolt to protect the free climbing that followed.



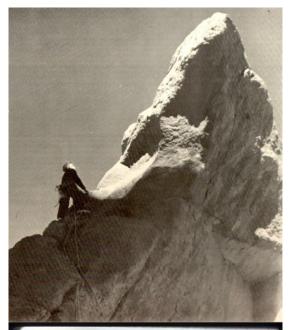
The Horn pitch.





Throwing the rope over the Horn for protection on the fifth class move.

Clever tactics used on the first ascent of the 'Horn Pitch' near the summit of Shiprock (top: Bancroft Library, bottom: Summit 1964).





Horn Pitch. Top: John Dyer, David Brower photo 1939. Dyer used the "lassoed" rope on the first ascent. Bottom: Left: John M. (Author), Walt Shipley photo 1988. We climbed it free at 5.9.

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More pics from the first ascent.



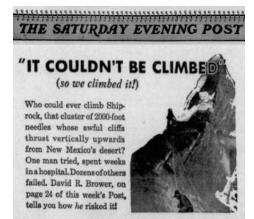




Dyer, Brower, Robinson and Bedayan, conquerors of Shiprock. They climbed the pinnacle "because it was there."

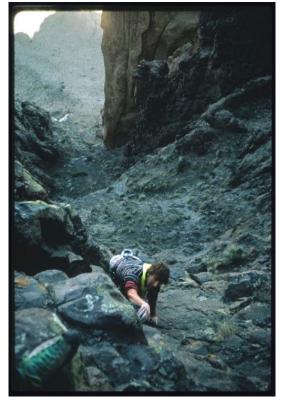


Robert Ormes in Colorado.



David Brower wrote an article for the February 3, 1940 Saturday Evening Post, concluding with how Raffi Bedayan forgot to leave his card on the summit: "Bedayan's Grocery, San Francisco. We deliver anywhere."

Author pics of Shiprock ascent



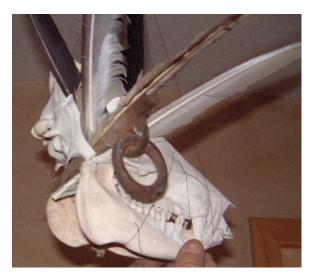


Walt liked to have a summit shot, but the timer on his Minox didn't provide the time for him to get in position. This butt shot might have been his third attempt, but at least he was on the summit. We then soloed the South Summit (5.8) before heading back up our fixed rope to the North Tower (actually using shoelaces to Prusik back up). It was the first time all three summits of Shiprock climbed in a day.

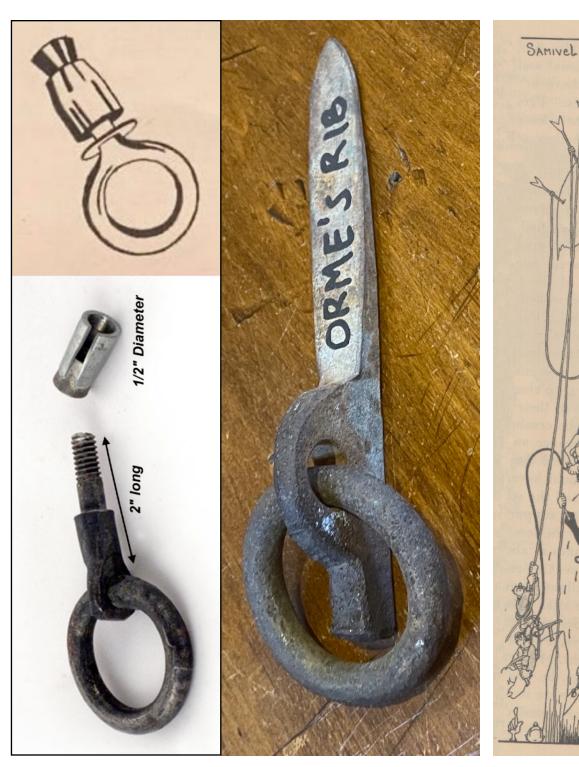
Walt and I free-soloed up to the Colorado Col with only one rope and a light rack of nuts, thinking we might be able to down climb into the Honeycomb Bowl on the normal route. Realising we couldn't we opted for the Ormes Rib, then fixed part of our rope from the North Summit into the Honeycomb Bowl as a means to return, cutting and using the remainder of our rope for the final pitch.

My old Toyota Corolla with integrated escape vehicle. This car made many adventures into 4WD terrain, the bike was needed many times. Circa 1988 or so, somewhere on the Navajo/Hopi reservations.





Walt Shipley memorial javelina skull we found in Sedona. Feathers appeared on routes we climbed together, and the piton is from Ormes Rib on Shiprock. He set it up in my A5 shop with nylon thread where it hung for years.



used on Shiprock in 1939.

Likely the type of bolts originally The piece of unbent steel Walt Shipley and I found on Shiprock north tower.

The envisioned future of bolts and other trickery.

Risk, rules, and shared knowledge--the complete set

When the bolt was introduced as valid crossover technology from the industrial anchoring and fastening industry, along came the often heated 'ethical' arguments regarding the new tool, along with other codes of conduct. As more Rock Climbing Sections (RCS) of various local chapters of the Sierra Club emerged, the rules were strict in terms of safety, led by the original RCS founder, Richard Leonard. FIRST, learn from the network directly, THEN, and only then, venture out on your own. In essence, a qualified training course. But not all tools were widely taught, like the art of handdrilling a safe bolt into a piece of vertical rock—which the RCS members pioneered some advanced tools were initially kept close by the cognoscenti. As interest in rock climbing grew, so did the formulation of cultivating a culture around the acceptable methods to ascend varied types and lengths of vertical rock—with a myriad of potential and newly imagined challenges all over the world.

By 1939, the complete set of rock ascending tools was in place:

- Protection for natural cracks (thin steel pitons and wood wedges/coins de bois).
- Ability to anchor in, and ascend blank rock (expansion bolts).
- Efficient anchoring and belay systems with ropes and points of intermediary protection connected by carabiners and importantly, slings—climbers often carried lengths of 8mm cord to connect rope systems, cut up as needed (the need for slings seems to have eluded many early piton/carabiner users, with ample stories of horrendous rope drag, but the use of slings was by now an established tool and technique).

SIERRA CLUB

San Francisco Bay Chapter TO MEMBERS OF THE ROCK CLIMBING SECTION:

All climbing with the ROCK CLIMBING SECTION is done strictly at the climber's own risk. However, safety is one of the cardinal principles of climbing. It is therefore urgently requested that members of the ROCK CLIMBING SECTION observe the following precautions:

- Practice climbing should never be attempted without an upper belay.
- (2) Each person should practice at least five minutes of "falls and belays" before each day of practice climbing.
- (3) No person should attempt to use a belay of any kind until he has first demonstrated to the Committee on Rock Climbing his ability to hold properly the particular belay that he intends to use.
- (4) Before starting each climb the climber should test his belay with his full weight upon the rope.
- (5) One should never attempt a climb without being sure that the securing knot is properly tied. It is earnestly recommended that climbers have a practical knowledge of all climbing knots.

- (6) Serious climbing in which an upper belay is not possible involves a different technique and more experience that practice climbing can give. It is therefore most a gly leadership of such a party without adequate and thorough preparation.

 recommended that no one attempt the
- (7) It is to be understood that safety in practice climbing depends upon the strength of the rope. Therefore no rope of doubtful quality or strength should ever be used.

November 23, 1932

COMMITTEE ON ROCK CLIMBING

RICHARD M. LEONARD Chairman MARJORY BRIDGE LEWIS F. CLARK JULES EICKORN KENNETH MAY In the periods that follow, refinements of these primary tools became safer, stronger, lighter, more versatile, functional, and convenient. Perhaps most critically for the rapid advancement of climbing standards and achievements, the tools also became increasingly available and more affordable. For North America's gigantic canyons and ranges of stone, such as those already explored in Utah, Colorado, and Wyoming, only the surface had been scratched, and more walls were beckoning. Warm climates offered relatively safe environments to develop sporting means of ascent, leading to breakthrough bigwall climbs in Yosemite in the 1940s. At the same time, climbers were pushing new realms of suffering on cold big stones in the North Cascades and other areas-- all training grounds where American climbers learned the mixed art of cold weather mountaineering and rock climbing on ever bigger climbs. The ability to roam off gird also became more possible for intrepid adventurers, as Jan and Herb Conn (known as the 'roving rock climbers') and others did, developing new playgrounds of bold climbs around North America.

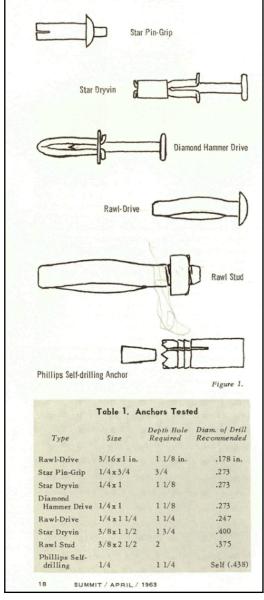
Bolt development (overview)

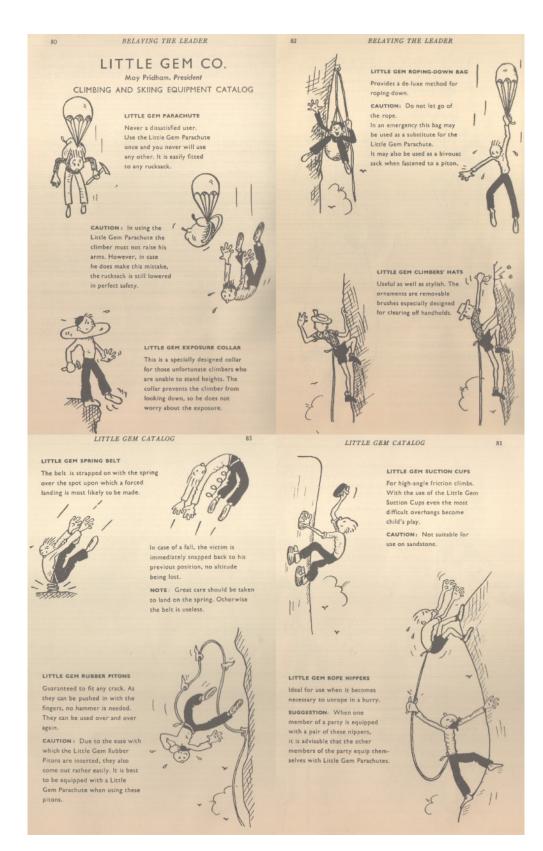
The bolt's initial refinement was to discover systems that provided enough strength for a minimal size hole. The bolts on Shiprock were 1/2" diameter eyebolts, easy enough to drill in volcanic tuff, but for harder rock, 1/2" bolts are way too time consuming to drill by hand. By 1949, climbers had discovered suitable 3/8" drill and bolt systems, and a decade later, 1/4"diameter bolts would become the standard.

Type of anchor	Diameter of hole (inches)	Length of hole (inches)	Yield strength (pounds)	Ultimate strength (pounds)
	(inches)	(miches)	- (pounds)	(pounds)
Mollya	5/16	3/8	150	400
Molly	3/8b	17/8		
Rawl Dryvinf	3/8	7/8	400	850
Rawl (Modification I) .	3/8	3/8	1000	1600
Rawl (Modification II) .	3/8	11/4	1300	2000c
Rawl Dryvin	5/8	13/8	800	2000+
Star Dryvine	5/16			
Star	3/8	13%	2000+	2000+
Star (shortened)	3/8	1	1900	20000

Chuck Wilt's test results in Expansion Anchors in Climbing, Sierra Club Bulletin, 1949

Various types of bolts came to play in the following decades. In 1949, Chuck Wilts, tested a number of 3/8" bolts, a time when the technology was also shifting from eyebolts to the more versatile system of using separate hangers ('bolt plates', originally called 'brackets'). Different drilling and bolting systems developed across the Atlantic, and the story of bolts in the following decades is extensive. For now, here are two snapshots in the North American literature, from 1949 and 1963.



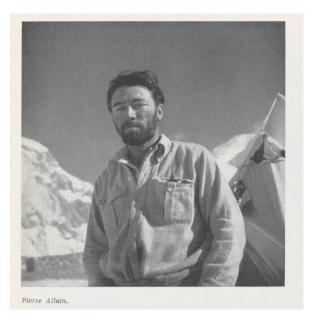


Big Wall Bivouacs

In this final section of Volume 2, we will consider another important part of the "kit" essential for multi-day rock climbs in America: lightweight bivouac and coldweather survival gear, carried on one's back or potentially hauled on steep rock.

European Advancements

Consider also the global culture of rock climbing in 1939, prior to the global war that soon followed. The Eastern Europeans had advanced aid climbing techniques to a high art form (see Volume 1), and in France, new realms of vertical challenge in high alpine environments had been well established, advancing from Allain and Leininger's climb of the north wall of the Dru in 1935, involving technical difficulty on long walls requiring multiple days and nights; climbers were developing not only top-level gymnastic ability but also cold-weather survival and expert glacier and vertical ice skills.



In France, Pierre Allain was not only pursuing the limits of the possible, but was also developing and supplying new tools, including cold weather equipment, and lighter primary tools, such as the aluminum carabiner. (Rivista Mensile del CAI 1936).



The north wall of the Dru, climbed in 1935

The pace in America

In contrast to Europe, where the market size allowed for the continued creativity of innovators and producers of top-quality equipment, like Pierre Allain in the 1930s, in North America, the development of new tools moved at a more gradual pace. There were clever inventors, but suppliers—those who were able to make batch production of useful gear—were few, and obtaining the latest tools and equipment from Europe posed increasing challenges as the pre-war years unfolded.

In the development of the tools and techniques, it is time to again consider how information was shared among climber groups, and how new tools and techniques became adopted and globally widespread.

Outdoor Leadership

Teachers who share knowledge, especially as it is being developed, often are unsung heroes in the march of progress. The original creators of new knowledge might be too focused on their creative pursuits to share their ideas, or might just want to keep the advantage to themselves. Often, a different mindset is required to navigate the challenging process of transforming ideas into practical products. As tools and techniques became more complicated and varied, the shared knowledge of their efficient safe use naturally emerges.

One of the great American educators of climbing and surviving in the mountains was Paul Petzoldt, who as a teenager in 1924, attempted the unclimbed east ridge of the Grand Teton with Ralph Herron, with only an "old hay rope", cotton shirts and cowboy boots. Halfway up, "lightning flashed like hell and the damnedest downpour you ever saw, with hail and then snow," and they suffered through a cold bivouac. After retreating and regrouping, the next day they climbed the original Owens-Spalding route,

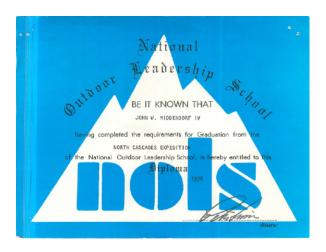
and soon Petzoldt learned the art of cold weather survival and began his guiding business in the Tetons. By 1929 he was awarded the first mountain climbing guiding concession in the newly established Grand Teton National Park, and hired top guides like Jack Durrance. Later in life, he founded the National Outdoor Leadership School (NOLS), which has taught so many the ways of the wilds, as well as the major proponent of sustainable LTS (Leave No Trace), a style distinct from traditional heavy-handed camp skills (e.g. cutting trees for shelter, etc.). By first learning—the hard way—efficient survival techniques using lightweight reliable equipment and food for living in the mountains, Petzoldt shared that knowledge, embarking on a career that transformed mountaineering education and the American quiding profession. As he progressed on his journey, teaching countless fledgling mountaineers the ways of the hills, he also played a key role in the development of a comprehensive lightweight toolkit for expeditionary climbing.



Petzoldt's ethos of Teton guiding was not just about getting clients up a mountain "sack-of-flour" style, as was the reputation of some guides in European mountain arenas (with its much longer history of professional mountain guiding), but was focused on creating experiences that led to lifelong learning in the wilds. The nature of the Teton mountain range encouraged this style of cultivating self-sufficiency, as the accessible environment, rising sharply from the Wyoming plains, within a few hours of foot travel, there lies a hostile wild environment that has the potential to quickly kill the unprepared.

Petzoldt and "campers"

Petzoldt was a member of the first American Expedition to K2 in 1938, and in a later interview and recalled that the lack of "camping skills" among some of the expedition members was the root cause of the failure of the early American expeditions to the Himalayas. "You just have to be a good camper", Petzold said of the 1938 expedition, "I knew how to camp and I kept the people in line, kept them from getting cold and kept them fed well and kept them from going too fast and over exerting and getting tired and setting the pace and rhythmic breathing and all that thing.". He attributed the overall relative lack of American success in the Himalayas to prima donnas who could climb well but lacked "camping" toughness: "They don't know what the hell they're doing. And that's the history of Himalayan climbing. Those guys weren't campers."112



In the 1970s, NOLS still adhered closely to Paul Petzold's original philosophy of preparedness in the mountains—in his words, good "campers".



Survival in the mountains requires experience, planning and careful selection of equipment (San Juans).

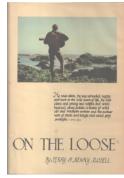
¹¹² Footnote: In the 1979 interview published in Off Belay, Petzoldt called his fellow expedition members in 1938 "children on the mountain"; however, the core members had extensive expedition climbing experience (Bob Bates on Mount Luciana in the Yukon, Charlie Houston on Foraker and Nanda Devi, Bill House on Mount Waddington) so this memory was hyperbole. Bill House, who led the notorious "House's Chimney" on K2 in 1938, a 45m near-vertical and smooth chimney, backed with ice, which required four hours of effort in the thin air of 6700m., joined Houston and Bates in a rebuttal letter signed, "The Children on the Mountain" (February 1980 Off Belay). Petzoldt attributed the tragic death of Dudley Wolfe on K2 in 1939 not to Weissner, Durrance, or Eaton Cromwell, as various attempts to conclusively lay blame on an individual persist, but to the fact that Wolfe wasn't a good "camper" ("the poor bastard, couldn't beat his way of a paper bag.").

Author's Note: My first climbing experiences were on the Western Slope of Colorado with the Telluride Mountaineering School (TMS) when I was 14, initially training for the 14,000-foot peaks, then delving into acrobatic rock climbing with mentors like Henry Barber, who climbed with us on the rock climbing week on the cliffs between Silverton and Durango. The Telluride Mountaineering School was the brainchild of Dave Farny, who extended the NOLS philosophy of Paul Petzoldt, and allowed the guides guite a bit of leeway to build toughness in students (once I was suddenly pushed down a 55-degree icy snow slope by the guides who wanted to see if I could self-arrest before hitting the bowl at the bottom—I could. I became a guide there myself in my third summer there, but refrained from pushing any students off precipices.) Later in the 1970s, I completed a NOLS course in the North Cascades, where I further honed my survival and climbing skills. The survival skills I learned in these mountaineering schools saved my life many times on the big rock wall projects of my climbing years, I am certain. A few decades later, on my first visit to the Tetons, I soloed the Owens Spaulding and also became eager to work in the ideal training grounds for leading trips and teaching mountain skills, and soon after worked as a guide for the Jackson Hole Mountain Guides for a couple of summers.



The author as a young learner of the mountains (age 14). Jed Dawson photo.





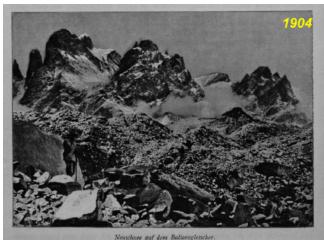
Our favorite TMS readings

locale of Skyline Ranch (TMS)--our mountain climbing school basecamp.

Himalayan and Karakoram Equipment Crossover

Of course, good camping skills require good camping equipment. Parallel to the burgeoning sport of rock climbing was the explosion of global interest in climbing the highest points on Earth in the 1930s. The giant remote mountains in the Himalava and Karakoram demanded larger teams in order to survive communally while traveling through hostile environments, with staged camps and extensive fixed ropes on the mountain, in contrast to the small-team approach of efficient rock climbing. The general developing boom of extreme weather camping equipment, as well as the recreational ski market, inspired the use of new materials and means of production. The advancing state-of-the-art in these realms brought crossover benefits to the rock climbers eyeing ever-bigger walls and considering the challenge of spending multiple days and nights on the vertical.

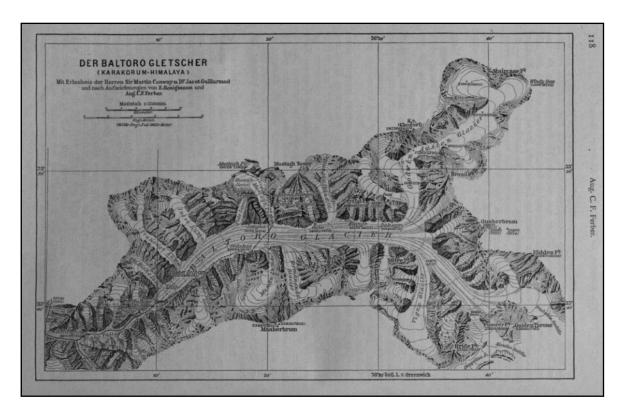




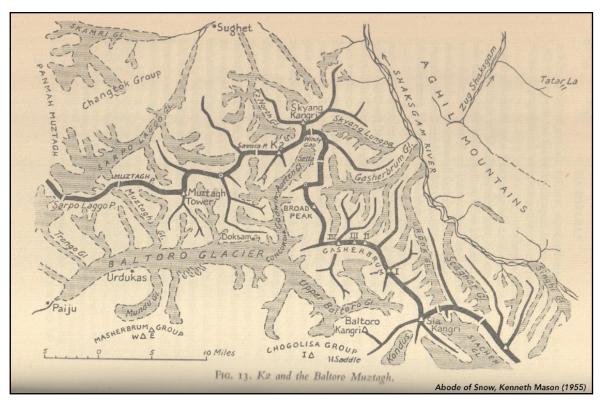




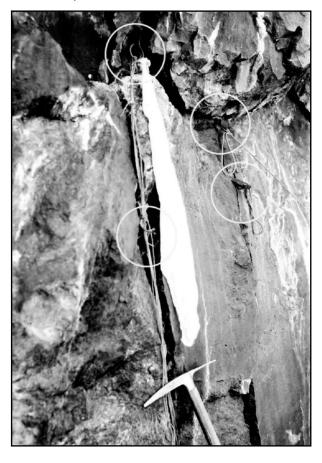
The biggest rock challenges came into focus during this period. Early images of Trango Group. Top: 1904 German expedition. Middle: One of Vittorio Sella's spectacular photographs taken during the 1909 Italian Karakoram expedition led by the Duke of Abruzzi which reached 6250m on K2--his photos sparked global awareness of the Karakoram mountain challenges. Bottom: 1936 French expedition. Uli Biaho on the left. Trango Tower on the right.



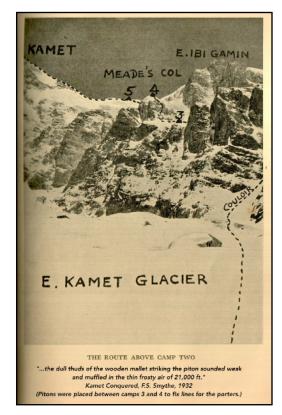
Following the 19th-century explorations of the Karakoram, the 1904 German/Austrian expedition produced this detailed map of "this mighty mountain world". Trango Glacier noted as 'Trahonge Luma' (CF Ferber, ZEITSCHRIFT ALPENVEREINS 1905)

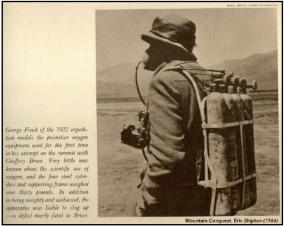


Likewise, the traditional big mountain climbers were adopting the new rock tools even as debates on "artificial aid" continued. 113 Even the back-of-the-envelope expedition climber Eric Shipton used pitons on Kamet in 1931 (expedition led by Frank Symthe) at 6400m using a lightweight wooden mallet (instead of a metal hammer), in order to fix ropes up a '1000-foot rock wall' above Camp III to create a 'safe route for laden porters.'



Pitons for fixed ropes (and a scarf) on Kanchenjunga in 1929 (Bauer); a high point at 7400m was reached (photo: Austrian Museum).





More artificial aid. As with all climbing tools, as the technology improved and oxygen systems got lighter and more reliable (more 'transparent', in design terms), the use of this aid becomes more readily adopted.

¹¹³ Footnote: artificial aid was pretty much anything besides a rope, crampons, and ice axe—and included supplemental oxygen. Pitons, even if just used for protection, were "artificial", although the long serrated flat ice pitons developed in the 19th century by Oscar Eckenstein do not seem to be considered artificial aid as they were simply more efficient tools than what an ice axe could provide—perhaps as they made the actual slope less slippery, the ice pitons helped slide the 'ethics' toward rock piton adoption (slippery slope joke btw).

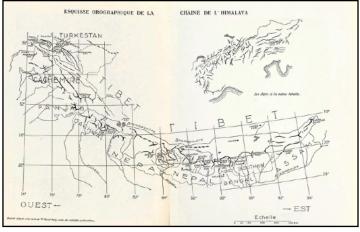
In the 19th century, multinational expeditions were common (e.g. British, Austrian, and Swiss members on the team), but by the late 1930s, when India only permitted one expedition organized by a single country per year, the big mountains became regarded as national 'preserves': Everest for the British, Kanchenjunga & Nanga Parbat for the German/Austrian teams, and K2 for the Americans (until 1954, when the Italians climbed it). Styles varied, but most were expanding and refining the evolving Himalayan strategy of large teams establishing staged camps and frequent travel between camps to create and stock a high camp for a final assault by a small team. By the 1930s, arguments against pitons in the high mountains had become moot, as the ability to fix, descend and later ascend a rope became intrinsic to the strategy. But on the 1938 American K2 expedition, the leader Charles Houston did not consider pitons necessary, as Petzoldt recalled: "Charlie was an anglophile. He was so anglophiled at that time that he forbade me to bring any pitons or carabiners on the trip. I used practically the last money I had to go into Pierre Allain's in Paris and buy me a bunch of pitons and carabiners. I had a chance to see some pictures of the mountains, and I wasn't going up there without any pitons or carabiners. And come to find out, Bill House had done

the same damn thing." It was lucky they did, as the many crux sections to their high point, including House's Chimney

pitch, could hardly have been climbed

without them, let alone re-ascended easily to stock the higher camps. In a few decades hence, the use of fixed ropes to ease the final push would become *the* most controversial technique in the specialized realm of Yosemite bigwall climbing.¹¹⁴

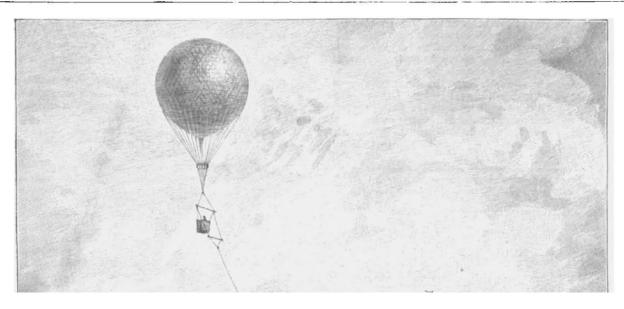
Next we will take a quick look at the 1939 state-of-the-art camping and survival equipment vital to long-term stays in the mountains; tools like tents, backpacks, stoves, lighting, and winter clothing (as well as a brief review of ice gear), so we can better understand how the development of such tools progressed. As Riccardo Cassin wrote in the Alpine Journal in 1972, the continual improvement in tools "extend the limit of difficulty even further and increase safety."



French map of the entire Himalaya chain of mountains.

La Montagne Revue Mensuelle, 1936

¹¹⁴ Footnote: Charles Houston had been on the successful British/American Nanda Devi expedition in 1936, which put Bill Tilman and Noel Odell on the summit. Tilman and Shipton had attempted Nanda Devi in 1934 as a small 'lightly laden' party that included three Sherpas, Ang Tharkay, Pasang Bhutia, and Kusang Namgay (three of the most experienced high-altitude climbers at the time), but the climb turned into a significant reconnaissance primarily due to the ability to travel fast and light (which Shipton/Tilman are best known for) and the discovery of an optimal ascent route on the south ridge, where they reached 6250m (note: back then published measurements were in feet, so the first ascent of Nanda Devi with a height of 25,645' feet (7816m)was a breakthrough "25-thousand-footer"—until the triumph of the metric system and the 14 peaks over 8000m became the modern tick list).



Strong airtight balloon fabrics were used for early mountaineering tents.

TENTS

The topic of tents and fabric structures is vast, and someday I would like to write more on the topic, as I once started a tension fabric structure business, designing double-curvature fabric structures. The structural and anticlastic design concepts of indigenous populations (of note are teepees and bedouin tents) took a very long time to be adopted in the outdoor industry, and most mountaineering shelters until the

1970s were either a tarp or simple covering, or a linear structure that was less effective with wind and snow loadings, albeit with improvements in weatherproofness, ventilation, and temperature control (that were inherent in indigenous designs). So we will not be delving deep into the theory in this volume. Instead, we will mostly consider the state of the art of various mountaineering and camping equipment in the late 1930s—the pre-Nylon equipment days.







rarticularly suitable to the Mountaineer, these excellent tents of world renown and fame have been made by us for a large number of year and are recommended by the Royal Geographical Society, having passed the test of time. Made in Green Millerain. Size B:

7' × 5' × 5' high.

Size C:

6'6' \times 4' \times 4' high. ents are fitted with inverted "V" Duralumin poles similar to the "Whymper", and sewn-in waterproof groundsheet of L.W. "Vertex".

Size C Weight £15 12 0 13½ lbs. £1 11 6 8 ozs. £2 14 6 1½ lbs. £7 4 0 4 lbs.

Simple A-frames: Whymper tent (1865), appears heavy and not too compact. Right: 1961 implementation of the Meade tent (a variant of the 'Whymper') made with a canvas fabric and weighed in at 6kg. with aluminum A-frame supports. In 1922, Charles Meade's original 'Meade design' weighed 8.5kg and was used on the first British Sagarmatha expedition.

Tent Evolution 1800s-1930s

Whymper's 1865 simple A-Frame tent design was pretty much the state of the art for the first 100 years of modern mountaineering. Various structural and design tweaks evolve with many variants produced with improved openings, vestibules, and later, double skin systems. New fabrics and aluminum structural components were the most significant drivers toward lighter-weight systems.

Mummery Tent Design 1890s-1950s

As a way to go as light as possible, the original 'Mummery tent', designed by Albert Mummery and used on his fated Nanga Parbat expedition in 1895 (as well as some earlier expeditions) was a floorless tarp/tent, with raised and tensioned sides for additional side-to-side room. The main supports were the long ice axes of the era, used with extenders for the larger versions; when set up properly, the Mummery tent was a suitable 4-season expedition tent design of minimal weight. Initially made from



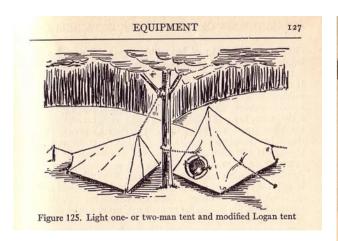
The floorless Mummery tent was a lightweight 2.5 kg. design, when used with ice axe supports and stones (or snow) to anchor and seal the floor flaps. From C.T. Dent's Mountaineering (1892).

lightweight silk (which would have offered a nice balance between waterproofness and breathability for cold climates), and later from 'aeronautical' (balloon) fabrics and other rubberized textiles. Typical two-person tents made of this floorless design and with materials of this period weighed about 2.5kg.





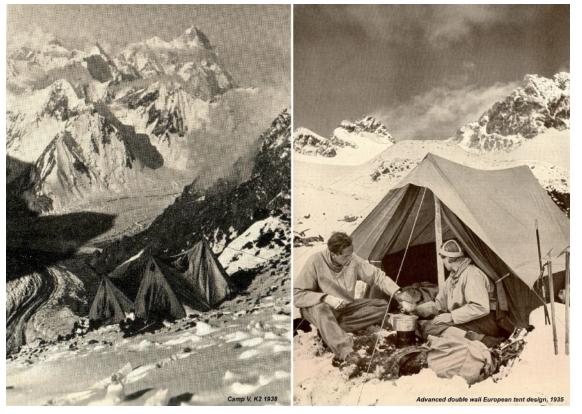
Mummery Tents in action--a floorless tent design (often used with separate groundsheet).



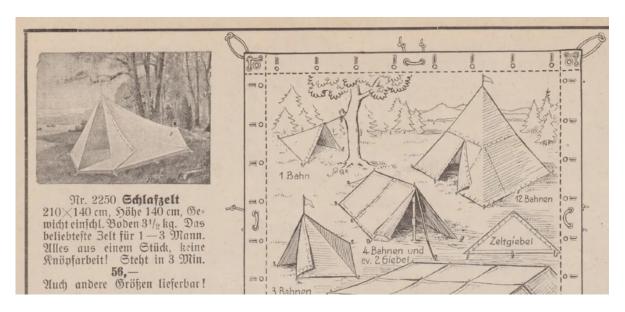
American tents until the 1950s were generally single wall tents made from relatively heavy waxed cotton canvas. In Europe, tent designers were moving toward lighter fabrics in the 1930s.



The single center pole Logan tent offers improved ventilation if the high and low airflow openings are designed well. For the 1938 American K2 expedition, the Logan basecamp tents weighed 6kg. (without pole).



Left: American-made Meade tents (left) at Camp 5 on K2, 1938 American K2 expedition. These Meade design tents (called the Yak tent) were established at the higher camps and weighed 5kg. Right: Interesting double wall tent design in the Austrian Alps, 1935.



1928 Sporthaus Jungborn catalog – simple and light designs in the spirit of Bauhaus.



ETUI and Grenfell ads, 1933 Mountaineering Journal. The Etui was a compact folding camera and used on Kamet in 1931. Middle: Grenfell Cloth was a brand name for one of many new lightweight weatherproof fabrics developed in the 1920s and 1930s with new weaves and various waterproofing agents, with varied waterproof/breathability characteristics.

Fabrics 1920s

In the 1920s, new processes for manufacturing expanded the availability of treated cotton fabrics, including paraffin-impregnated canvas fabrics, sometimes called 'waxed cotton', a fabric that could be thinly and densely woven to provide both water resistance and breathability. Many specialized weatherresistant lightweight cotton fabrics were developed and branded in this period, with various weaves and impregnated with oil, wax, or other hydrophobic additives, for example, the Grenfell woven twill fabric, advertised as "snowproof, rainproof, and windproof."

Different fabrics then, as now, had different tradeoffs between weather-proofness and breathability and some of the 1930s cottonbased materials would be competitive with many modern synthetics today. The basic concept is that material itself is made waterresistant and does not absorb water, but due to the porous weave, water under pressure will pass through, though with tighter weaves and heavier impregnation, cotton-based fabrics could be made effectively waterproof. For different conditions, different fabrics were preferred more breathable (and thus less waterproof) for cold and dry climates where only snow is expected, or more waterproof for wetter climes.

Rubberized fabrics were also manufactured as high-pressure waterproof textiles, and by the 1920s, Goodrich Rubber Co. (Akron, Ohio) and other manufacturers had improved significantly on the Mackintoshtype fabrics, with the ability to durably double-coat fine-thread cotton fabrics with very thin and flexible layers of latex rubber

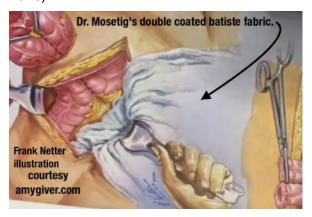
SOME FACTS ABOUT TENTS

Gerry 1960 catalog

Cotton is still the best tent facric for many applications, but it is no longer the only choice available. There are many uses where the new synthetics are superior to cotton. Which you choose depends on the use to which you will put your tent. There is no single fabric that will be "best" under all circumstances. Cotton, for instance, can be woven very closely and it holds water repellent treatments better than most synthetics. However, it is weak to begin with and is subject to mildew, so that a 3 to 5 oz. fabric is required for reasonable durability. Nylon on the other hand, has the highest strength of any fiber and a $1\frac{1}{4}$ oz. fabric is entirely practical for some uses. It is unaffected by mildew, even when packed away wet. Nowever, nylon is not yet a good wet weather fabric because it will not retain its water repellency after weathering. Nylon makes a fine high altitude or winter tent where liquid precipitation is not encountered. For wet weather, a nylon tent must be protected by a rain fly to keep the direct rain off. This is the only method we know of to make a nylon tent rainproof. In spite of two layers of fabric the weight can still be kept below one layer of 5 oz. cotton and gives more durability. If rain protection is more important than light weight, a cotton Element Cloth tent is a best buy. If light weight or durability is more important, then a nylon tent and fly is indicated. For winter or high altitude use a single layer of nylon gives the lightest possible tent. If lightest possible weight and rain protection is required, there seems no alternative to frequent applications of a wax base repellent to a single layer of nylon.

Most tent walls were made of various cotton fabrics until the later 1960s when improved coated nylon and polyester fabrics became available.

(creating a '3-ply' fabric). One of the lightest, strongest, and most flexible waterproof fabrics of this period used by the outdoor industry, was the 'Mosetig batiste', produced for the medical industry "to keep patients dry during operations" (think: similar to those crinkly plasticity pillowcases and bed covers you see in hospitals). The original development of the fabric is attributed to Professor von Mosetig from Vienna, who designed it for surgical operations to prevent bodily fluids from escaping, and it was widely available globally (price: \$1.25 per yard in America in 1915).



The Mosetig rubberized batiste fabric made for surgical operations was readily available and a favorite for lightweight waterproof climber bivouac sacks.

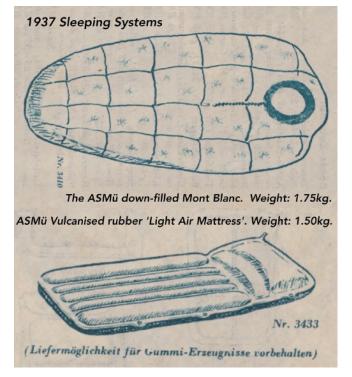


Competing versions of the Welzenbach tent.

1930s lightweight tents

For alpine and wall climbing, a lightweight tent design known as the "high-touring tent", a design of Willi Welzenbach, was made by a number of makers. ASMü offered a lightweight version made with their trademark "Himalayan Linen", a waxed cotton fabric for the walls for breathability, and a fully waterproof material for the floor. The two-person high-touring tent offered in 1937 weighed 2.3kg—an improvement to the prior state-of-the-art in a lightweight fully enclosed weatherproof design that could be set up in tighter spots with its small footprint.¹¹⁵

The total weight of the lightest weatherproof systems of tents, sleeping bags, and pads for two people in the late 1930s was about 10kg (5kg. per person), not much more than most camp systems for the rest of the 20th century (until the advent of ultra-light materials in recent decades).



¹¹⁵ Footnote: the ASMü High Touring Tent cost 63 German marks in 1937—typical two-person tents made from heavier material were twice the weight and half the cost—a time when carabiners were about two for a mark, so the cost for a good lightweight tent was equivalent to the cost of about 100 carabiners.). Note that these 1937 two-person tents only weighed about a kilo more than more modern single-wall expedition two-person tent designs in the 1990s.



In the 1930s, Willi Welzenbach's tent design with two short poles was the era's lightest two-person shelter for severe conditions. Vigilance would be required to keep snow from piling up on the top of this version with its gently sloped top surface.

Lighter Bivy Systems – Zdarsky tents

For those wanting to go even lighter, various cliff shelter systems were developed. A popular one during this period was the Zdarsky sack—basically two sheets of fully waterproof fabric sewn together to make a large envelope with an opening on the long side, designed as a group shelter for people

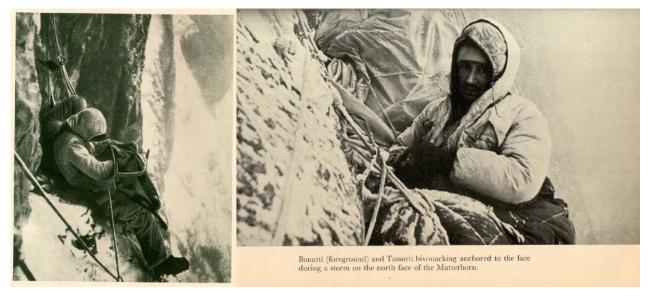
to huddle under as a storm passes. Zdarsky was an inventive ski pioneer who developed tools and techniques for skiing, including the single-pole telemark style called the 'alpine (Lillienfeld) ski technique'. Two attachment points were often sewn into the corners of a Zdarsky tent to suspend it from higher anchors.

The Zdarsky tent is often described in the literature with many variations in size, materials, and the design of the vents and windows. The ASMü 1937 catalog description for the Zdarsky tent reads: "Essential protection against the cold for mountain climbs and bivouacs. Made of thin Mosetig rubber batiste, windproof and waterproof, all seams taped. In sack form with closable vent hole." Mizzi Langer made a version from a thin rubberised cambric fabric that weighed only 600 grams (200cm long, 135cm width).

The 1933 Canadian Alpine Journal describes three sizes: "The Zdarsky bags come in three sizes: 175 cm. high by 200 cm. long (or about $5\frac{1}{4} \times 6\frac{1}{2}$ ft.), for 1-2 persons; 175×250 cm. $(5\frac{1}{4} \times 8\frac{1}{4}$ ft.), for 3-4 persons; and 175×300 cm. $(5\frac{1}{4} \times 9\frac{3}{4}$ ft.), for 5-6 persons. The weight is from 800 to 1200 gms. $(1\frac{3}{4}$ to $2\frac{3}{4}$ lbs.) for the three



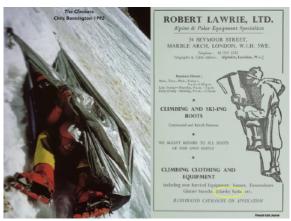
Left: Zdarsky and his inventive telemark bindings and 220cm skis. Right: a Zdarsky tent in action.



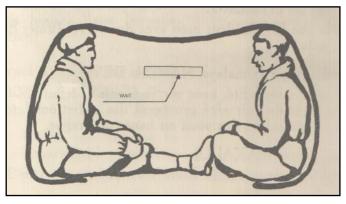
Left: Eiger bivouac site on the first ascent—a Zdarsky sack was noted as part of the kit (not shown as such shelters were generally only deployed during storms when photography was impossible).

Right: Walter Bonatti on the north wall of the Matterhorn, with Tassotti in a bivy sack.

sizes." The Zdarsky design is primarily used as an overhead shelter while huddled in a small area, and brought along as emergency equipment even on day climbs (e.g. Tami Knight recalls "four of us piled under the envelope-like tent" during an impromptu bivouac while climbing a new route on Mount Munday in 1985). The design also has morphed into a sideopening design that can be securely anchored on steep slopes as a type of two-point hammock, particularly useful still today when a snow ledge can be carved out on long steep alpine routes.



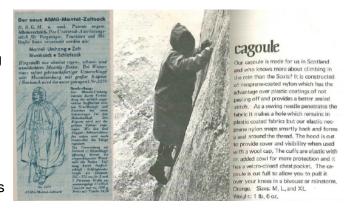
Left: Later evolution of the Zdarsky tent as a hanging two-point hammock. Right: Robert Lawrie was a major supplier of international expeditions for much of the 20th century (Pinnacle Club Journal).



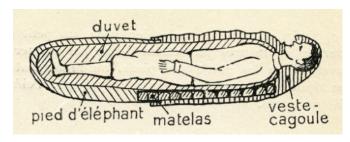
In the 1964 Edouard Frendo catalog, the Zdarsky Sack is described: "It is a large rectangular bag made of waterproof nylon (200 × 160cm). This bag can be hung on a rock wall, above the bivouac platform by two small loops attached to the upper corners. Climbers enter the bag through the opening below and sit facing each other (see sketch). In the middle and on the sides, there is a ventilation opening that can be opened or closed from the inside. In short, a ZDARSKY bivouac bag is a kind of simplified tent whose heads of users form the masts. Weight 900 g. This bag is executed in bright bright red color so that it can be seen from a long distance." These are also known as bothy bags in the UK.

Cagoule and elephant foot.

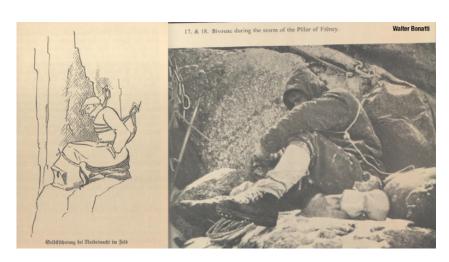
In the guest for lightness, many climbers did away with any sort of shelter, resorting to simply bundling up with layers of outerwear for cliff bivouacs. Specialized full-length bivouac sacks were also available but not always ideal for mobility and ensuring a tight line to the anchor, while perched on a small ledge and sitting up all night. A popular outer covering design in the 1930s was called the Sohm's Tent Coat, basically, a long waterproof poncho noted as a "practical combination of tent, sleeping bag, and raincoat", and weighing in at about a kilogram. This design quickly morphed into the cagoule, with added arm sleeves, and became a core bivouac system that was still popular in the 1970s (the 1972 Chouinard foamback cagoule pictured had enough room to tuck in the knees while sitting and be completely covered). Emptied packs could be used as extra protection for the legs, and ropes as a ground pad. Pierre Allain came up with an integrated system using a cagoule and a footbag (in lieu of an emptied pack), the half-bivy sack coined the 'Pied d'élephant' (elephant's foot).



The 1937 ASMü tent coat and the 1972 Chouinard Cagoule.



Complete bivouac system designed and made by Pierre Allain in the 1930s using a cagoule and an "elephant's foot" — a half-length bivy sack for the legs called the 'pied d'éléphant'.



On many climbs, climbers just suffer with minimal extra bivy equipment.



Author's note: Part of the Telluride Mountaineering School's training to become a guide, was to first work the summer guiding season as a 'guide-schooler', who didn't make a wage, but had some of the responsibilities of a guide. At the end of the guide schooling season, the final exam was to spend two nights out on a 'solo'. The solo involved being blindfolded and taken deep into the high mountains, just at treeline, and be tied to a tree near a small creek, where you spent the first night with only the clothes you had on, and remaining blindfolded. So the idea when you left the ranch, you were bundled up with as many layers as we possessed and could borrow. The bivy system was the Chouinard foamback cagoule, considered a shelter that could withstand any storm. So each of us in our own separate unknown environment would huddle under our foambacks, shivering all night long.

The next morning, a guide would come and untie and un-blindfold us, and provide us with some parachute cord, a knife, a limited number of matches (I think only 3), a billy can, and a big slab of raw cow, which was to be our only supplemental food. The idea was to at least know the old techniques of cutting tree boughs for shelter, the art of a small continuous-fire, and other survival skills. But mostly it taught us that we could suffer more than we had previously imagined, with the most minimal bivouac equipment—a valuable lesson as I continued to push my own limits of suffering on various climbing adventures seeking optimum kit (as well as the many ways to make paintbrush tea).



Telluride Mountaineering School guides and students, 1974. Mike and Dave Farny front row left.

My older cousins Ben Dawson and David Osborn next to Mike, and Jed Dawson bottom right.

Hans Figi top second from left.

Climbing Packs 1920s-1950s (brief pictorial overview)

For climbing in the 1920s and 1930s, a simple rucksack without outside pockets were preferred. These were generally a simple tapered sack, with a single top-point attachment for a shoulder harness.

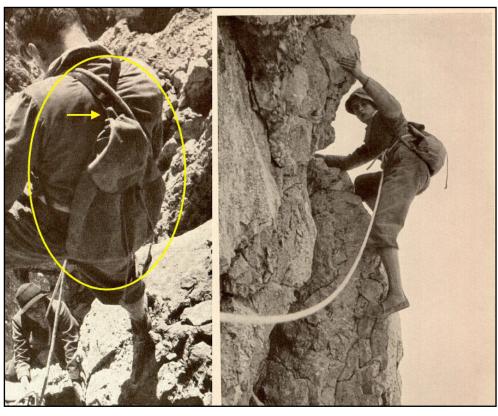


1928 Sporthaus Jungborn catalog (machinetranslated by Google). The stabilising waist belt was a relatively new idea for production rucksacks.

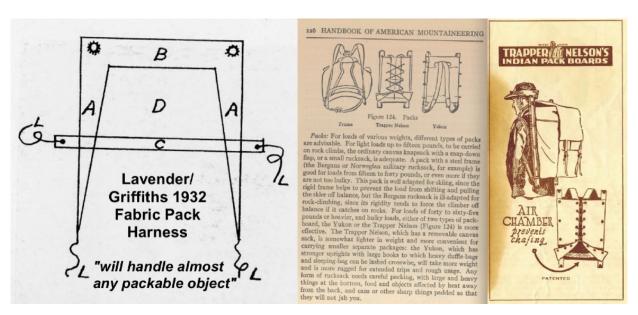
Semi-frame

For semi-frame packs in the period, the state-of-the-art pack design was the Norwegian Bergans-Meis design, sold globally (imported into the USA by Abercrombie and Fitch). These were suitable for loads up to about 20kg.





Simple rucksacks in the 1920s—no external pockets (as preferred for climbing), single-point attachment for shoulder straps. (Photos: Der Mensch am Berg, 1935).

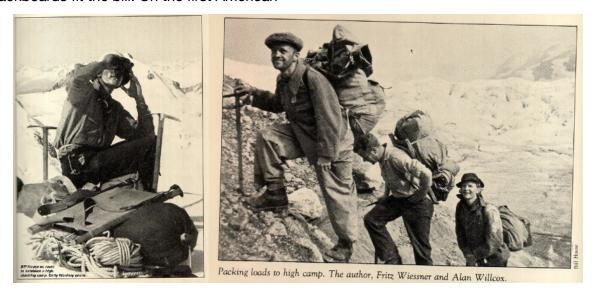


Left: Fabric pack harness used to lash onto duffel bags to carry gear 1932. Center: various rigid pack frames shown in the Handbook of American Mountaineering, 1942. Right: 'Trapper Nelson' frame packs designed by Lloyd Nelson were popular design from the 1930s to 1970s.

Heavier loads

Bigwalls need a lot of gear brought to base camp, so for heavier loads, separate frames or harness systems were lashed to duffels and other carrying sacks. Lavender and Griffith record a harness system used in Colorado and on Denali by Parker and Browne. For the heaviest loads, framed backboards fit the bill. On the first American

expedition to K2, the team had light aluminum pack-frames, to which all sorts of equipment was lashed for the porters in 23kg. loads—duffel bags, wood boxes (10" x 12" x 20"), sacks of food, etc. The aluminum frames used in 1938 were made by Camp and Sports, 'Everest Model," and only weighed 680g. (1.5lbs.).



On Mount Waddington, the East Coast team with different pack designs. Fritz Wiessner's sack is of particular interest, as it looks custom-made and appears to be a large-capacity soft pack. From: Off the Beaten Track, by Elizabeth D. Woolsey (1984).



Jump to the 1960s: Integrated framed packs were becoming popular in the 1950s, but even in the 1960s pack innovators like Gerry Cunningham still offered frames and sacks separately, as lashing one's own sack onto a frame was a basic skill and still favored by many for versatility. Gerry 1961 Catalog. The backpacking business really boomed in the 60s and 70s, and the evolution hence is a topic for another book. Kelty was one of the first major manufacturers to offer integrated frame/sack packs in the 1950s.



Left: Betty Woolsey and her pup in the 1930s. Right: pack systems for ski touring 1930s. From Off the Beaten Track, Elizabeth Woolsey, 1984.



Various packs in the 1920s and 1930s (Left: Don Munday, Right: Charlie Houston.



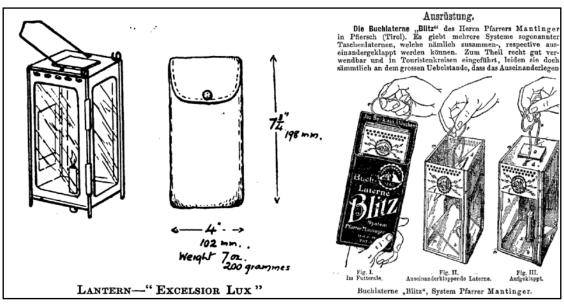
Back to the future. After a few decades of frame packs for larger volume loads, soft packs again became mainstream in the 1980s. Photo: author with home on my back leading the initial pitches up to the snow cave camp on Cerro Torre, 1993 (from there, 12 hours to the summit!).

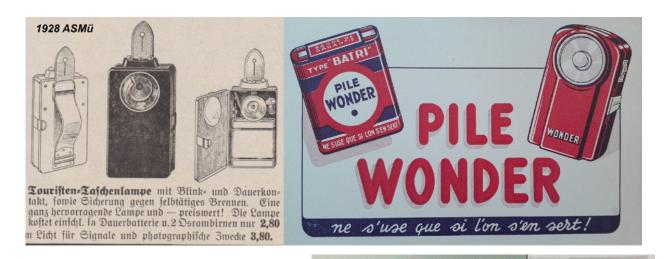


The Primus burner became the standard for all multi-fuel stoves, with further continual innovations tailored for mountaineering, notably the Optimus Svea and MSR XGK.

COOKING AND LIGHTING 1920s-1930s







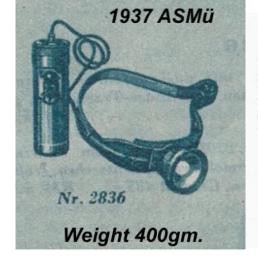
Despite the availability of portable electric light in the 1920s and 1930s, most climbers still preferred the folding candle lanterns for lighting long descents in the dark. Batteries in those day were horrible, of course, and even into the 1980s, it was difficult to find a good headlight that could enable long climbing hours in the dark.

Right: You would probably need all those batteries to do what the simplest rechargeable LED headlights could do today.



HEAD TORCH

This is a useful piece of equipment. The Ever-Ready torch is rather heavy, particularly the battery container. Also its life is rather short. The $4\frac{1}{2}$ volt Ever-Ready battery—type 126—is a useful battery with a good life. This can be encased in plastic, with two leads fitted permanently to the screw connectors. A male and female 2-prong socket can then be attached to the lead to act as a switch. This means there is no danger of the torch being switched on accidentally.





NOTES ON EQUIPMENT AND TECHNIQUE by Chris Bonnington, 1962 Alpine Journal



State of the art headlamp, 1980s, with halogen and regular bulbs. Used 4.5V flat batteries or AA's with adapter. Good for a few hours light.





More 1990s gear for comparison. The advent of propane/butane gas canisters was a boon for cold conditions. The previous Bluet butane canisters required keeping warm to produce a reasonable cooking flame. Xaver Bongard, my partner on Great Trango Tower, told me how he nearly blew his fingers off when he was heating a butane cartridge on the Eiger, forcing a bloody hand retreat. The Markill hanging stove was the most efficient stove with its nestled and ventilated pot holder system in the days before heat exchanger stoves.



The Markill Stormy on Great Trango, The Grand Voyage. We also had a MSR XGK for daily snow melting, which we could only do in clear weather in our portaledge.

Ice Tool Developments and Innovations (brief)



Cover of The Alpinist, A Guide to the High Mountain World, 1911.



As the climbing got steeper, so did the ascent of tool design.

General Evolution—ice tools overview to late 1970s.

Most of the research in these pages are about the tools for bigwall rock climbs, but let's examine some of the evolution of the most iconic piece of mountaineering gear, the ice axe, since the beginning.

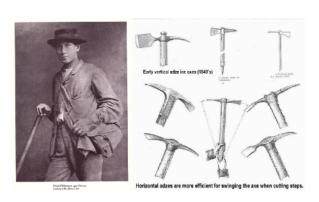
Early History: The first axes were cast:



1800's: In the 1800s, the metal (steel) components were hand-forged in shops like this:

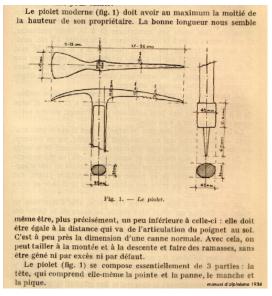


Later 1800s to 1950s: Designs evolved with added <u>adzes</u>, first vertical like a wood axe, then horizontal as an improved design for cutting steps in glacial ice. Whymper was an early proponent of the horizontal adze, but in his famous portrait, he has an axe with a vertical adze.

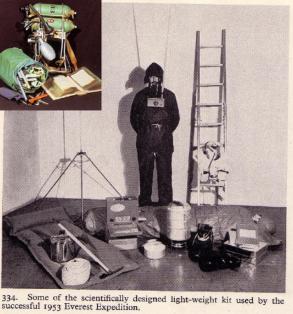


Whymper with a vertical adze ice axe, and the variants during the transition to horizontal adzes as standard design.

The shafts on early ice axes were generally over a meter long, doubling as a comfortable walking stick. As climbing became more popular and demand increased, ice axes were mass-produced with drop forge machines. The design remained pretty much the same for over 100 years with only a slight droop on the pick.







Ice axe design changed little between 1913-1953. Note the men's and women's models of ice axes sold by Abercrombie and Fitch, a major supplier of outdoor gear in the pre-WW2 years in America. The A&F "Life or Rope Belt" (1916) is an early climbing harness.

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For climbers who were mostly using ice axes to get to get to a rock climb, Kenneth Henderson in the 1942 Handbook of American Mountaineering recommended cutting stock shafts to as short as 15 inches long (38cm) so the tool could be carried in a pack without interfering with climbing.

Ice protection 1930s

Ice pitons in the 1930s were simple shafts of flat steel. Various serrated designs were developed, in order to conceptionally (not always practically) increase pull-out strength — a simple design that remained the standard until the late 1950s. This type of ice piton could support the weight of a climber but would pull out in a long fall. Ice pitons were installed easily into glacial ice with a hammer:



Placing an ice piton. Note the chopped steps, as most climbers until the 1960s still used traditional crampons with only downward points.

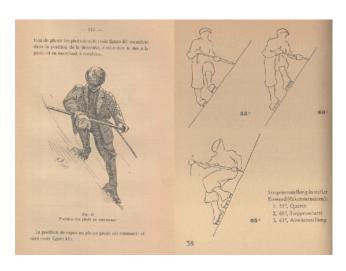


Left: Figures 1 and 2 (side and top view) were noted as a new design in 1939, using the offset eye design, which provided slightly better pullout resistance. The design in Figure 3 had been in use since the early 1900s. Right: Marty Karabin collection.





New ice piton by Jungel superseding the Wilo Welzenbach design, late 1920s, "made of wrought iron that is not too soft but not too brittle either. The ice hooks are mostly made as ring hooks; Duralumin hooks have not proven themselves and are too expensive. A number of years ago, Italian ice climbers recommended a 25cm tubular design, not common in our country" (Maduschka, ~1930).



Prior to the widespread use of front point crampons, most glacial slopes could be climbed with "flat-footing" (Pied à plat in French) methods. In the 1970s André Contanime perfected this balancy Piolet style, with many refinements of technique.

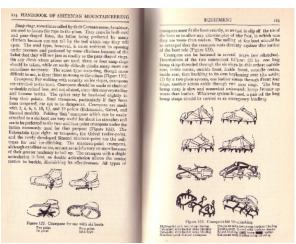
Crampons 1910-1950s



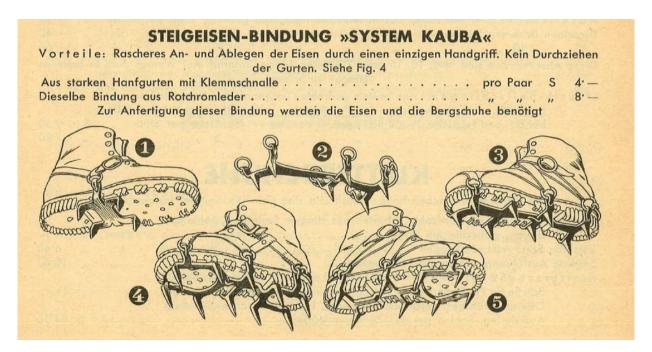
Eckenstein design, 10 points (4 on the heel, 2 in the midsole, 4 in the front), with a single hinge point. A standard design for most of the 20th century, first produced by Henry Grivel in 1910.



Oscar Eckenstein with his gang in North Wales (seated, second from left with rope). An egalitarian portrait of a climbing community in the pre-WWI years.



Various textbook designs in the 1930s and 1940s. Note the 12-point Grivel listed in Henderson's 1942 instructional. 284

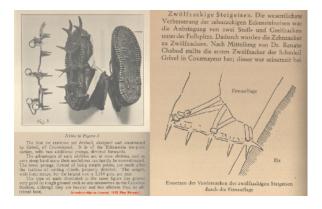


Mizzi Langer Kauba's catalog illustrations show the variant designs available in 1937. The Eckenstein 10-point design (#4) was the standard for serious climbing.

Front Points Appear

Front point crampons were first made by Grivel in 1927, and initially considered a highly specialist tool. They were notably used on the first ascent of the north wall of the Eiger (see Volume 1), and they were also used in 1936 on the 'tremendous Mer-de-Glace face' on the north wall of the Grandes Jorasses (Rudolf Peters and Martin Meier), and on the first ascents of Siiolchu (6887) near Kangchenjunga (Paul Bauer and team), and Tent Peak (7363m) in the Sikkim Himalaya (Ernst Grob, Paidar, and Ludwig Schmaderer).





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Ice Daggers & Ice Screws

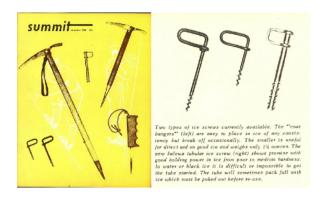
Ice daggers were an important transitional tool from climbing with one ice axe to two, and were superceded when the ice dagger concept was merged with the piton hammer to create early ice hammers.



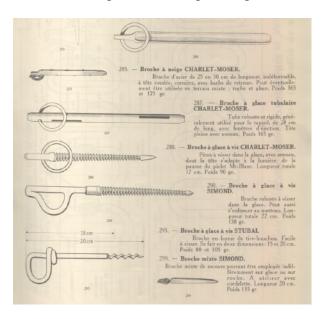
Ice daggers, first seen as modified ice pitons (left) were used as a lightweight second tool for steep ice. A short-lived technique once smaller ice hammers became available.



Left: Tubular designs, 1958: unthreaded tubes, appearing in the 1940s, could be placed in harder ice, but were not strong in pull-out strength. Right: Chouinard catalog 1970. Hermann Huber's Salewa tubular ice screw design underwent a number of improvements, including thicker teeth soldered to the cutting edge, which made the resulting ice core smaller than the main diameter of the tube, so the ice was easy to remove from the tool after use. The Salewa Spiral piton was an improvement on the Warthog design originally developed in the Soviet Union and an ideal tool for softer glacial ice, but for hard waterfall ice, they were too blunt and would shatter the ice.

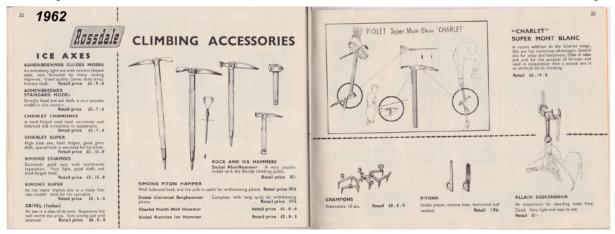


Summit Magazine cover 1965 state-of-theart ice climbing equipment. Note the shorter "alpine" ice axe, at the time still considered experimental. The ice dagger shown was a short-lived concept. The corkscrew ice piton design was offered by Stubai in 1961 and later became widely sought after as cool wine bottle openers but this design was weak as an anchor in ice. The tubular ice screw (far right), developed by Hermann Huber and first produced by Salewa in 1964, revolutionized ice protection with pull-out strengths exceeding 1200kg.



The moment before invention. 1965 Frendo catalog shown, with various ice screw designs prior to the threaded hollow tube design. The Salewa ice screw made new realms of difficulty on vertical ice possible.

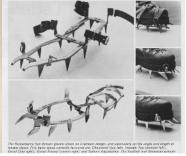
Jump to the 1960s and the transition to two tools for steep ice.



Front points refined

Even though front-point crampons had been manufactured by Grivel since 1927, for decades most climbers continued with the versatile hinged 10-point Eckenstein-type crampons for most climbs, resorting to the age-old technique of chopping steps on the steepest ice, until the advent of fully rigid front-point crampons, as hinged crampons are tenuous when front pointing with flexible boots due to flex of the boot/ crampon system. Strength and durability were also issues with early designs, as thin sharp front points needed to penetrate hard ice were prone to failure (and were not designed for modern higher-stress dry-tooling on rock techniques). Front-point crampons were originally called "toe point" crampons in the USA, and in the era prior to fully rigid plastic boots, the rigid crampon design was essential for the steepest waterfall ice. 116



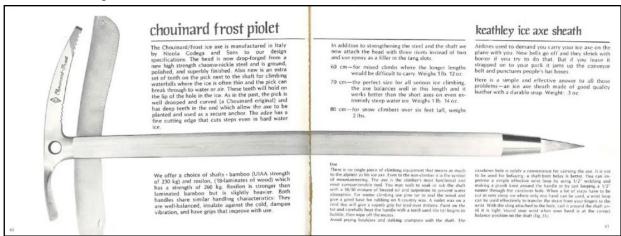


Frost's rigid crampon design (1960s), with horizontal front points. Note the design of the two forward-facing and two downward-facing points to create a secure '4-point' placement. In 1972, Mike Lowe improved on the rigid crampon design with the rigid Footfang with vertical hooking front points (as were the original 1927 design).

1972 Mountain Magazine review shows variants of front point crampons, both hinged and rigid designs. The Chouinard/Salewa rigid crampons (top center) were made from 4130 steel and designed and manufactured by Tom Frost and Yvon Chouinard in the 1960s.

¹¹⁶ During his first trip to the Himalayas during the 1963 Himalayan Schoolhouse Expedition led by Edmund Hillary, Tom Frost once explained to me how he zenned in on watching the pattern of his partner's spikes on various angles of the glacial ice, and an improved rigid crampon design that would work with flexible boots came to him in a flash. The adjustable rigid frame design closely follows the edge of the boot's sole, eliminating flex between the boot and crampon. His engineered design using six parts fastened with set screws, adjustable for any size boot, became standard on many of the hardest climbs of the 1970s and 1980s. The early models had issues with heat treatment, and many failed when used with flexible boots, but by the late 1970s, the issues had been worked out (plus climbers were transitioning to ever-stiffer boots). In 2023, Yvon Chouinard told me, "Looking back, it would have been better to work on rigid boots first."

The Droop transforms into a Beak, 1970s



1975 Chouinard/Frost Piolet.

In the late 1960s, the Chouinard/Frost Piolet added a bit more droop to the traditional pick, which held better in thin ice (than a straight pick) and was easier to swing into the ice. In the early 1970s, the Snowdon Mouldings Curver took the concept a step further with a curvature that followed the radius swing of the short-shafted tool.

One of the more significant early developments in the late 1960s, which took time and refinement before it became a standard design, was the Terrordactyl by Hamish MacInnes, with a radically angled

straight pick. The Terrordactyl required a different placement technique in ice than tools with curved picks, which were designed to swing through an arc. The MacInnes' design required more of a hooking motion to set the tool, and would hold well in even the thinnest ice (and on rock). Both types of pick designs were in play for a while, but as steep waterfall ice became popular, the hook-type front picks in various forms, angles, etc, became the prevalent design starting with an era of innovation in the 1970s and still today.



Hamish MacInnes (John Cleare photo) and his Terrordactyl designs advertised in Mountain Magazine. In 1972, these cost £9.75 (~\$24 USD at the time). MacInnes credits his inspiration for the steep pick from the way ship anchors catch securely.

Into the 70s and 80s

In 1971, Jim McCarthy published "Coming of Age—Ice Climbing Developments in North America" in the American Alpine Journal, foreseeing the incredible advancements in technical ice climbing that was to come in the following decade. And as the standards rose and new techniques developed, so did the variety of specialized tools for the job. McCarthy concludes, "Armed with these tools and techniques a small but rapidly growing number of American ice climbers are busily engaged in a great game called "Find the Ice." In the last two years truly challenging climbs have been discovered in the Pacific Palisades, the Northeast and the Canadian Rockies. The adventure begins."

In the 1972 Alpine Journal, Bill March and John Cunningham published 'New ice climbing techniques and equipment' with more details and which helped many begin their adventures on ice.



Jeff Lowe demonstrating a heel-down stable stance made possible with rigid crampons on vertical ice, with four points stabilized in the ice. The sequence shows the placement of the latest hammer-in, screw-out ice piton design, the tubular Snarg ice piton, another useful tool for protecting steep water ice.

Snarg Ice Pitons

The Snarg Ice Piton offers the secure protection of a tubular ice screw, but you need only one hand to place it. Set it in a hole started by your Hummingbird, then trive it home. The bevelled tube rections back pressure and ensures superb holding strength.

Choose a Threaded Snarg for even better grip in the ice. Remove it by unscrewing it. The Smooth Snargs can be pulled out after you have loosened them with several turns.

Snargs have an anvil that extends above the eye and the tube. This can be used as a wrench to help other Snargs that have frozen into their placements, or to help clear the ice out through the milled

Technical Specifications:

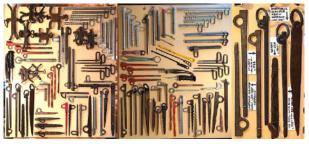
- 5/8" diameter Chrome-moly tubing.
- Bevelled tube increases holding strength, minimizes back pressure
- Choose either threaded or smooth models.
- Milled slot facilitates clearing.
- Offset anvil may be used as a wrench to break loose another, frozen-in Snarg, or to help clear ice through slot.
- U.S. Patent 4064-665.

Sizes: 6" and 9" Threaded. 9" Unthreaded.

Chock Tocker: Handy tool for all rock climbers. Use the weighted head for testing pins or tapping out harmed nuts. The tapered tall hooks to help you fanancie chocks out of awkward slots. Page 21



Jim Bridwell with Lowe Footfangs, Lee Vining Canyon, Summit, 1984.







Various ice screws (1990s). Lots could be written about the pluses and minuses of each design, and how and why they came about.



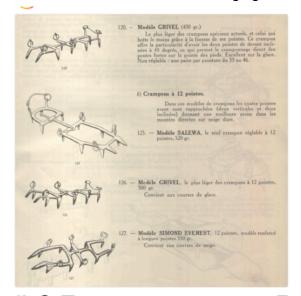
Simond and Stubai Tools, 1992. The hinged crampons worked well with rigid plastic boots, and the versatile Stubai ice tool could be quickly transformed into a shovel with a lightweight attachment even with thick gloves and no need for tools.

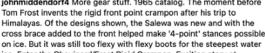


Simond crampons, Stubai ice tool, and my Chouinard ice hammer (pictured next page) on top of Great Trango, 1992. A great compact and versatile kit. For the steep water ice pitches in Gollum's Gully, we combined our two primary tools for the leader.



Left: Two of my first ice tools, late 1970s. The redhandled Snowdon Mouldings ice axe (left) produced by Mo Antoine and Joe Brown had a curve that followed the radius swing of the short-shafted tool. My well-used Terrordactyl (center) was the first forerunner of modern steeply angled picks of today's ice tools (to the right of the Terrordactyl is my wine bottle opener). Right: this Mountain Technology Glencoe ice axe (UK) would still would be a favorite tool when only a short approach on ice is required-very lightweight and with the most classic curve for swinging!





bigwallgear.com

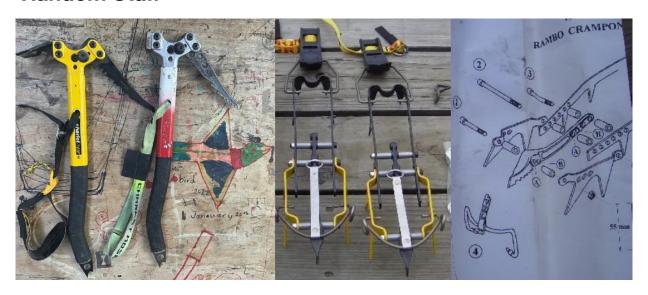
 \square johnmiddendorf4 More gear stuff. 1965 catalog. The moment before ice. Enter the Chouinard/Frost Rigid Crampon. Exciting story at



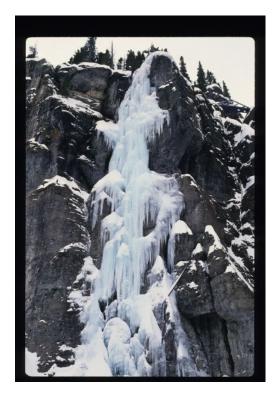
Above: A good example of ongoing refinement of a design in a production setting to produce a lovely second or third tool for alpine ice climbing. Left: Chouinard 1972 Alpine Hammer design. Right: 1975 design, now an effective ice tool with a minor pick modification by the user. Described in the 1975 Great Pacific Iron Works catalog: "Over the years the Alpine Hammer has gone through four major design changes. This model has an added set of teeth on the pick next to the shaft for climbing waterfalls where the ice is often thin and the pick breaks through to water or air. The pick also has a bit more droop than before. It requires a subtle wrist action to place it without bashing your knuckles but you gain by not having to swing as hard. The same holding power can be achieved with the pick driven less deeply into the ice. The hammer can also be removed more quickly in sticky ice, thus saving considerable time and energy."

This has only been a brief overview of ice climbing tool development in the early period; for more detail on the ice tool development, the book Alpinisme, La Saga des Inventions (Gilles Modica, 2013) has details. For the best online museums for the older tools, see Marty Karabin's amazing collection and Vertical Archeology.

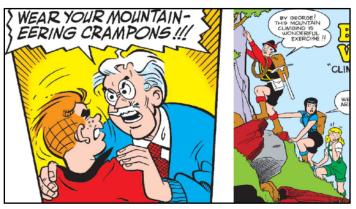
Random Stuff



1990s state-of-the-art tools for steep ice, with reverse-curve picks. In the 1990s, more radical innovation brought new techniques. The single front point design allowed for a whole new way of climbing ice, with more gymnastic climbing movement made possible with a greater ability to pivot on the ice, as well as being more precise for dry-rock climbing.



A typical cutting-edge ice challenge of the 1990s. Carl Tobin and I climbed this rarely-formed frozen ice pitch on a Telluride climbing trip.



Mountaineering references in Remi's bedtime readings.



2023 State of the Art ice axe, single front point crampons, and lightweight warm stiff boots.

Ice Tools summary: The pace of innovation

The evolution of mountaineering's iconic tool, the ice axe, alongside other spawned tools of ascent such as ice screws and crampons, illustrates a common pattern in innovation: a tool undergoes initial development and refinement, with a number of variants favored or dismissed by proponents. Once a tool reaches the stage of significant production, its design might remain fixed for periods, sometimes decades, such as the design of the long ice axe with slightly curved pick and horizontal adze. Sometimes a new idea is presented but not immediately adopted widely, such as when the Terrordactyl with its modern steep hooking pick appears, the prior (curved arc) style continues to be refined concurrently for a time. Some designs, like front point crampons, are introduced but remain less popular; then, often with the emergence of new materials and refined designs, in this case almost 40 years later, a new iteration of the design appears and captures the entire market. Often it is the small producers who are tinkering with batches of new variant designs, and old ideas are sometimes merged: ice screws evolved from hammerin, to screw-in, then back to hammer-in (and screw-out). Engineers with an interest in climbing work behind the scenes, analyzing and testing new tools while providing fresh design directions. Over time, design variants tend to stabilize, and eventually, a specific and versatile tool design becomes mainstream.

Leo Maduschka identified a major shift in climbing sytles in the 1930s, when he wrote a treatise on how "modern icecraft follows modern rockcraft"—in contrast to an earlier age when snow and ice were the first steps in mountaineering. And as new techniques and skills are developed during these shifts, the climbers seeking new standards of difficulty are often the drivers for change.

In the development of tools and corresponding techniques for climbing the vertical, many new ideas remain purely conceptual until a collaboration among talented individuals—artists, engineers, product testers, and producers—comes together to transform the idea into a usable tool. This art of design is a much-studied field, and the evolution of ice tool design highlights the incremental and sometimes staccato development and refinement of new tools.¹¹⁷



Fun easy-angled ice pitch on Cerro Torre; Fitzroy in background.

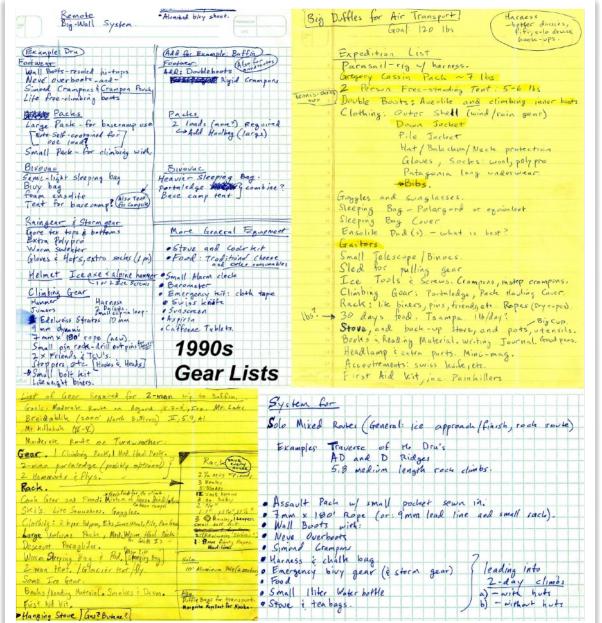
¹¹⁷ Footnote: there would be a bazillion examples of imagined ideas, ranging from the wild fantasies of missile launched grappling irons and suction cups to logical refinements of existing designs that have the potential to enhance the tools and techniques of climbing, and much fewer examples of one-off physical prototype designs that could be field tested. And much fewer yet of ideas that make it to a production phase—the fun of prototyping a small batch of a product quickly becomes work to create a production system and requires a very broad engineering mindset that comprises most of the ninety-eight per cent hard work of the invention/genius inspiration/perspiration adage oft attributed to the inventor and entrepreneur Thomas Edison.



An alpine bivevec on a shall ledge with typical collection of gare for a major rock route on e big sowey mountain; crossly about 10–12,000(r; 30.69 – 3.658m), in Brouge or a bit flower in USA. Variations on the them

- wind and showerproof parks aémost waterproof, Large hand
 dismers
 small pad of closed-cell foam for
 small pad of closed-cell foam for

State-of-the-art equipment, 1979 (The World Guide to Mountains and Mountaineering, John Cleare, 1979). Except for the gas stove, climbing helmets, synthetic fabrics, and slightly more modern designs, this could be a scene of a 1930s typical big wall bivouac.



Next for Volume 3

Volume 3 will cover global developments of climbing tools and techniques, beginning in the 1940s and 1950s.

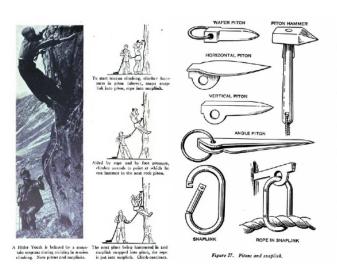
Developments during WW2 (brief overview)

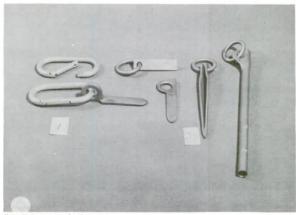
As war expanded in Europe, in December 1940 the American Alpine Club established the Defence Committee, with the goal of "supplying the Army with information concerning equipment to be used in mountainous regions." The initial crew was chaired by Walter Wood and included Richard Leonard, Kenneth Henderson, Charles Houston, and Bestor Robinson. With military funding and inventive climbers, mountaineering and survival equipment advanced considerably in the period between 1940-1944, leading to improved outdoor gear made for arctic conditions, ski gear, and other camping equipment.



Experimental Arctic

Pitons





Snap Links And Pitons

Left: Army's Mountain Operations' initial conception of techniques needed to siege the Alps. Ad Carter of the American Alpine Club was the primary translator of the German, French, and other language mountaineering textbooks that provided many English readers with their first explanations of the types of climbing overseas.

1944

Pitons

A selection of pitons, including some of the first angle pitons (with ring) were developed for the army with the help of The Mountaineers' Exchange in San Francisco and manufactured by the Ames Baldwin and Wyoming Co., in Parkersburg, West Virginia. During trainings in 1943-1944, thousands of army pitons were hammered into the cliffs of nearby Seneca Rocks. As a typical pack carried by mountain troops could weigh over 35kg, designers strove to make additional climbing equipment as light and functional as possible (footnote: not much is known about the Mountaineer's Exchange in San Francisco, cited in the Quartermaster Equipment for Special Forces, by Thomas M. Pitkin, Office of the Quartermaster General, 1944--thanks to Lance Blyth for this source).



Off Belay, April 1973

"War Stories"

Photographs by Duke Watson

The army unit responsible for the lines of rusty pitons at Seneca was made up of select volunteers from the reconnistance troop of the 10th Mountain Division, according to former Army Captain Duke Watson. And if anyone should know, it's Duke, according to the same of the army climbing school during the last is mornish it was active there in 1943. during the last is mornish it was active there in 1943. etc.—the 87th Mountain Infantry—was an off-shoot of a special ski partou unit drawn from the 15th Infantry at Fort Lewis, Washington. That group was led by Real Lafferty, who together with John Woodward, gathered together the key people to form the new outfit.

gathered together the key people to norm the low outfit.

Lafferty, who now lives in Eugene, Oregon, took a detachment to West Virginia in spring on 1943. Their objective was to establish a special training program for combat in mountainous terrain. West Virginia was chosen since the mountains resembled the Appenines and lower ranges of the Alps. The result of their effort was a "maneuvers" area spanning most of their effort was a "maneuvers" area spanning most of their effort was a "maneuvers" area spanning most of their effort was a "maneuvers" area spanning most of most mountain the spanning most of their effort was a "maneuvers" area spanning most of most mountain the spanning most of their effort was a "maneuvers" and the spanning most of the spannin

located at Elkins, West Virginia, some forty miles from Seneca. The combst regiments were taught the fundamentals of military travel in rugged terrain. The restance of military travel in rugged terrain that the rugged terrain that



One crew worked with pack animais, another, the engineers, improvised river crossings. The medica were in a specific property of the control of the control



Italian front. Eleven hundred soldiers accorded a steep examinent during a night assault. McCown six a key man in this action, and lost his life in the hattle. McCown six a key man in this action, and lost his life in the hattle. McCown six a key man in this action, and lost his life in the hattle. McCown six a key man in this action, and lost his life in the hattle. McCown as the commander of the rock climbing school. His staff consisted of many of the top climbers of his staff consisted of many of the top climbers of the staff leading was supply officer. Among the first time control of the sever removed, but enough remained that generation. David Brower was second in command. Raffi Bedayn. As supply officer, a mong but a few, most of these were removed, but enough remained that generation. David Brower was second in command. The limbing equipment. For furnisety, most of these were removed, but enough remained that generation and size climbing equipment. For furnisety, most of these were removed, but enough remained to find the several point of the several remained and several points. Many of the more dramatic lines were put in the several points and the several points. We were removed, but enough remained to the several points and issue climbing equipment. For furnisety, most of these were removed, but enough remained to the several points and issue climbing equipment. For furnisety was the several points and issue climbing equipment. For furnisety was the several points and issue climbing equipment. For furnisety was the several points and issue climbing equipment. For furnisety was the several points and the several points







Carabiners

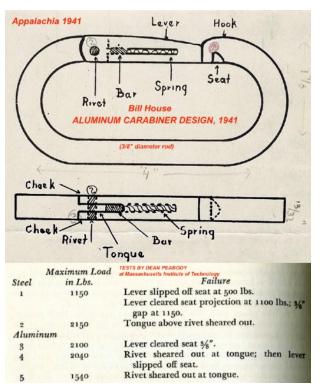
Bill House became head of the Army's Quartermaster General Mountain Unit, responsible for determining mountaineering equipment specifications. In 1941 he began working with the Aluminum Company of America to develop new light and strong carabiners (then still called 'snap-links' or karabiners—Pierre Allain in France had been developing aluminum carabiners prior to the war, but it wasn't until the later 1940s that aluminum carabiners became commercially available). House had begun with the standard toothed gate ('hook and seat') design, but by 1943 the Army aluminum carabiners had evolved to a pinned gate design, which became the standard for most aluminum carabiners for the next four decades.





1945 - Mousqueton matricé à chaud en Duralumin (commercialisé en 1948 7) - (PA2) Compagnie Générale d'Electro-Métallurgie - Usine de Corru - Rai (Orne) Plan daté du 11/207/1945. Le trêlle est la marque du matricuer. Brevet FR966655 du 22/05/48 Doigt tubulaire avec goupille. Dimensions: 54 x 108 mm - 68 grammes - Résistance : 750 kg (brevet)







1950s Bedayn aluminum carabiners (the earliest ones are stamped 'Bedayan') 297

Nylon Ropes

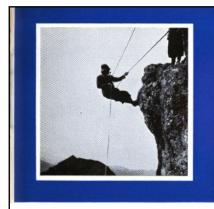
Richard Leonard, meanwhile, as the leading expert in rope dynamics, became executive officer of the Quartermaster

General's Special Forces equipment unit, and working with the Plymouth Cordage Company in Massachusetts developed and standardized the first 7/16" diameter, 120' long, 3-ply nylon climbing ropes (weight: 6.5lbs, strength: 3400 lbs). Leonard worked with the engineer Arnold Wexler (1918-1997), working at the National Bureau of Standards in Washington D.C., who developed a comprehensive theoretical analysis of the forces involved in climbing falls with the new, high-elongation nylon

ropes (thus, low-impact), and tested his theories with 'Oscar', his 68kg. dummy, at Carderock near Washington D.C. Nylon ropes improved handling and did not absorb as much water in wet conditions as did the natural fiber ropes (though many still preferred the natural fiber ropes because they were low stretch—those who were not doing much falling, in other words, perhaps using the rope more like a

lasso or as a way to hoist your second up).

Bill House describes Leonard's work on ropes in 1946 'Special War Number' American Alpine Journal, "The almost incredible performance of some of the



MOUNTAIN CLIMBING ROPE

Plymouth-made Mounting Climbing Ropes are available in both Manila and Nylon. The Manila rope is made from the same high quality fiber as our yacht ropes. It is strong, smooth, flexible and resistant to abrasion. It remains the world-standard, hard fiber mountain climbing rope. Plymouth Nylon Mountain Climbing Ropes, developed by us during World War II, are now being used by every type of climbing enthusiast. Its unusual tensile strength, fine handling qualities and great resistance to abrasion are widely known. It is the added advantages of high elasticity and energy-absorbing qualities that make Plymouth Nylon the finest and safest mountain climbing rope available.

PECIFICATIONS:

IBER CONTENT — Bymouth Yacht
Quality Manila Blend; CONSTRUCTON — Mountain Climbing Rope
ny; SIZE RANGE — 160 feet
TANDARD COILS — 120 feet

PECIFICATIONS:

IBER CONTENT — Synthetic discont Virgin Nylon; CONSTRUCTION

3 strand Mountain Climbing Rope

ny; Size Range — 38 and 18 dia...

TANDARD COILS — 1200 and

	LAL SIZE	NET WT. PER 100 FT.	APPROX. SHIPPING WEIGHT STANDARD COL	MINIMUM TENSLE STRENGTH
11/4"	%"	4.05	50	1,590
11/4"	%4"	5.10	60	1,930
11/2"	1/4"	6.54	80	2,920

| PLYMOUTH NYLON MOUNTAIN CLIMBING ROPE | MOUN

A PERSONAL PROPERTY AND A SECRETARIAN

Left: Plymouth Cordage Company "Manual of Rope Usage" 1948. Right: Nylon ropes in Europe, 1952, In another twist of shared language, 'Perlon', here shown as a brand for a typical 3-ply twisted rope, was initially a tradename for the universal Nylon 6 synthetic fibers used for strong and resilient ropes, but in the USA, the term 'perlon' came to represent the later kernmantle rope design.

synthetic fibers suggested an investigation there. Under the able direction of Richard Leonard work was undertaken in cooperation with the Plymouth Cordage Company, and tests were made of many different types, consistencies and lays of nylon rope. With no exceptions the final choice of medium lay bright nylon was found to be superior to the highest grades of Manila. Chief and foremost was its great resistance to shock. It was found to absorb over three times the shock loading as the same weight of Manila. As an example, the best grades of Manila could be stretched only to approximately 13% of their length before breakage, whereas the nylon rope would stretch over 39%. Use of this rope in army rock climbing schools, where it received very heavy use, justified the confidence placed in it, and at the present time only high price should keep all mountaineers from using it."

Plymouth was to later commercialise, using gold dye, the famous Goldline climbing ropes with improved strength (4850lbs. for 7/16" diameter), which became the standard American climbing rope for the next three decades. British Ropes Limited created the Viking nylon ropes in the UK, and a number of European brands also began manufacturing a variety of nylon ropes. The 3-ply, medium lay carried over from the manila design, remained the standard until the increased availability of reliable kernmantle ropes in the 1960s.

Deciphering

In Volume 3, we'll also try to decipher various definitions of climbing itself as it evolved in different regions. For example, consider these two mentions of climbing styles in the same journal in 1952 (AAJ):

Balance Climbing: "Since layback pitonpounding proved too difficult, Soler drove in six pitons for direct aid, skillfully edging on top of the one he had just placed in order to drive the next one. This maneuver whereby each piton was used first as a handhold, then as a foothold, without a rope sling, was a beautiful example of balance climbing. The 23rd piton, placed in a horizontal side crack in the left-hand overhanging column, permitted a short traverse and rétablissement118 to its sloping, splintered topthe first belay point on the climb. After the other climbers had "prusiked" up to this platform, three more pitons were used before the party reached the big ledge at the N. end, from which an easy scramble led to the summit. During the 9½-hour climb, 26 pitons (24 of them angle pitons) had been used. The first pitch of what is now officially known as the Soler Route was belayed through pitons from the bottom during a 240-ft. lead!" --A.C. Lembeck, A New Route on Devils Tower, Wyoming.

Climbing Free: "So we started out. The extremely difficult part begins with a long piton traverse to the left, some 100 meters above the base. Emilio climbed most of that pitch freehanging by pitons and little holds, not using the rope for pull at all. He put in very few karabiners, thus making it necessary for me to climb free. too. I found my way to a piton that he had used for a belay. As I removed the karabiner, I lost my grip on the piton, my only hold, and fell. For what seemed an endless time, I became a terrifying pendulum, swinging in space. Emilio held me with the help of some pitons. When I finally stopped moving, I found myself several feet away from the rock. It took much effort and time to swing back to the rock, anchor myself, and work my way back. This incident ended the attempt and the season."

-- Hans Kraus, Summer in the Dolomites.

¹¹⁸ Footnote: rétablissement is a French word for reestablishing, here a named maneuver, probably a mantle.

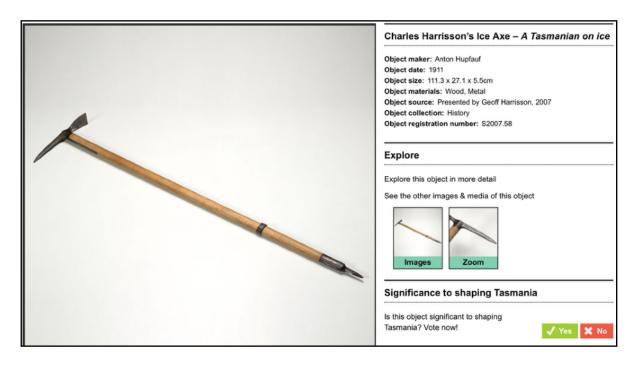
Innovation origins by small shop producers

During the home shop innovation period of the 1950s in the USA, we'll consider the collaboration of engineering and design, as well as sources of steel for some earlier European pitons as well as the famous chrome vanadium used for Salathe's original Lost Arrows, and the chrome-molybdenum piton era of the mid-1950s.





It is possible that some of the earlier Swiss pitons were made from high-strength alloys, prior to chrome vanadium used in the mid-1940s. The years leading up to WW2 involved strategic nationalism control of the supply of steel, and involves the study on the types of steel being produced (and used by climbing piton makers) in different regions.

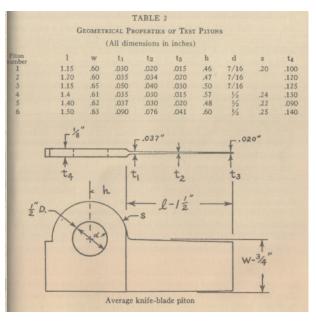


Forged Swiss Steel found its way around the world, even in this island off an island down under (Tasmania). Anton Hupfauf in Switzerland also made some of the world's best rock climbing pitons in the 1930s, which were imported into America by Abercrombie and Fitch.

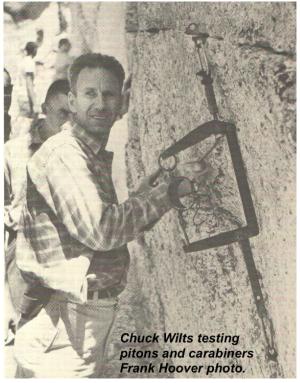


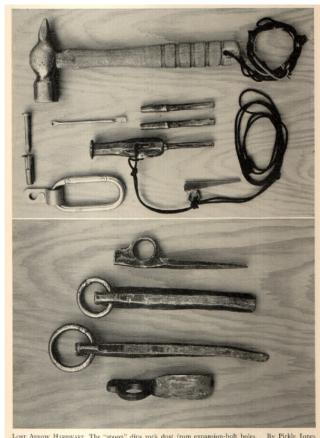


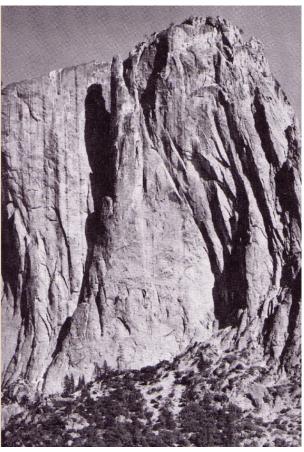




Caltech engineer Chuck Wilts published technical information that led to the chromemoly piton revolution in the 1950s, enabling the design of the thinnest of thin pitons, as well as larger angle pitons that held well in hard rock.







Early bigwall 'kit' crafted by John Salathé and deployed on the Lost Arrow Chimney, 5.8, A3, Yosemite National Park, with Ax Nelson, September, 1947.

In Volume 3, we'll examine more nuances of the evolution of climbing tools and technology, that parallel the well-known climbs which pushed new boundaries and amazed everyone, including often the participants themselves. As North America prospered, Europe rose like a phoenix from the ashes of war, a global network of mountaineering organizations bloomed, and so did the climbing standards in the periods to follow, along with the rapid evolution of the stronger, lighter, and more versatile climbing tools made possible with advancing technologies. The notion of what was considered possible on the wild vertical became a global phenomenon, and we will zero in on the highly specialized kit required for the biggest rock challenges.

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Again, apologies for lack of proper index. The digital PDF of this research work is easily searchable and online at <u>bigwalls.net</u> and at <u>archive.org</u>

Comments on Mechanical Advantage: John, this is just fantastic stuff! Wow! Chris Jones, Author, Climbing in North

You are collecting material of lasting interest and value. Keep it up. Cheers, Jerry Gallwas

America

I've been enjoying the march of climbing history in your emails! Big props for the work you are doing! Doug Robinson

You are doing with your work exactly what Guy and I hoped--seeing something new and taking what we had dug up to the next step. Your words come through beautifully. Laura Waterman

John - amazing work and dedication. I love your attention to details of course but even more your attention to action, to writing, to publishing and to sparking the narrative and the spirit. Timmy O'Neill

Yours are the best researched histories I have read. P.s. I am sitting with Grant. He says hi. Ken Yager

Riveting, John. Oh, those lumps of rock/ice whizzing by! Bob Brown

I've really liked most of your Mechanical Advantages, but Envisioning of Pitons (Miriam O'Brien) is the best! Richard Goldstone

These pages are amazing. Absolutely fascinating stuff. Cam Burns

"Deucey delivers a sizzling epoch, like A5 hammer blows on an aluminum mashie!" James 'Sam' Vivian

We climbers are lucky to have people like John who are both deeply interested in climbing history as well as experienced in pushing the leading edge themselves. Wetmore on news.ycombinator

"Valuable work." Yvon Chouinard.